

JOURNAL  
OF  
THE MILITARY SERVICE INSTITUTION  
OF THE  
UNITED STATES.

---

*"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."*—SHERMAN.

---

VOL. XXII.

FEBRUARY, 1898.

NO. XCII.

---

HASTY INTRENCHMENTS IN THE WAR OF  
SECESSION.\*

BY MAJOR A. L. WAGNER, ASSISTANT ADJUTANT-GENERAL U. S. ARMY.

EVERY war recorded in history presents certain characteristic features, more or less pronounced, of strategy, tactics, or logistics, that distinguish it from all other conflicts, and give it, as it were, an individuality altogether its own. The mention of the Thirty Years' War brings at once to mind the newly-invented cartridge, the light leather cannon, and the comparatively shallow formation with which the Swedes opposed the dense columns of the Imperialists. The mention of the Seven Years' War conjures up visions of the oblique order of battle, and of the newly-created horse artillery, while all the campaigns of Frederick seem to resound with the clink of the Old Dessauer's new iron ramrod. The Napoleonic wars combine Wallenstein's ruthless methods of living upon the country with the methodical magazine system that characterized the wars of Eugene or Frederick; they present to us the spectacle of the triumph of small columns over the anachronistic linear tactics that survived the great Prussian king, and the subsequent victory of flexible lines over the monstrous columns introduced by vicious tactics. The Crimean War gives us the

---

\* Read before Military Historical Society of Massachusetts in Boston, December 7, 1897.

spectacle of field-works growing into a mighty fortress, and a campaign resolving itself into a gigantic siege. The Italian war of 1859 is marked by the introduction of rifled cannon; and our great Civil War presents many characteristic features, chief among which were the advent of iron-clad ships into naval warfare, far-reaching cavalry raids, and above all, a use of hasty intrenchments to a degree never before known and never since equalled.

It was the last-mentioned feature—the use of hasty intrenchments—that constituted the most marked characteristic of the Rebellion. Not that there was anything new in the mere employment of intrenchments on the field of battle; for the military student recalls at once the redoubts at the Alma, the fortified Santon at Austerlitz, the crude lines against which British valor was wrecked at New Orleans, or the breastworks of the “embattled farmers” at Bunker Hill. Indeed the retrospect carries us back to the barricade of Harold at Hastings, to the ditches of Sylla at Orchomenos, even to the intrenchments of Mardonius at Plataea; and, in fact, so far into the remote past as to convince us that intrenchments on the field of battle are as old as war, and war, we know, is as old as the human race. The peculiarity of the hasty intrenchments in the War of Secession lay in their habitual and almost universal use, and in their being constructed generally in the actual presence of the enemy, often under a musketry fire of an intensity and destructiveness never before known.

The conditions of warfare existing in 1861 were new. The military world was already on the threshold of that transition period which was to make war less romantic and more scientific; the period in which new and great discoveries and inventions which had arisen to benefit the condition of man were to be turned to his destruction. The smooth-bore artillery had been greatly improved by the introduction of the Napoleon gun, and the rifled principle had been successfully applied to field artillery. In small arms the Minié rifle had already appeared, though it had not yet been carried in the same campaign by two opposing armies. In 1861 rifled cannon and rifled muskets were both tried and recognized weapons; the effective range of artillery had nearly doubled, that of small-arms had almost

trebled, and the two forces about to engage in conflict, whatever their other defects, were composed of men most of whom had been accustomed to the use of fire-arms from their youth. As a result, the zone of fire separating the combatants at the beginning of the battle had been greatly increased, and the intensity of fire had been enormously developed. It seems now, in the light of past events, that these conditions should have caused the military leaders at once to recognize that the advantages conferred upon the tactical defensive by the new weapons could be enhanced by the use of hasty intrenchments; and that, under the storm of fire encountered, the attacking force might find it necessary to intrench under fire, in order to hold what it had gained or to check an impending counter assault. These facts were clearly understood long before the close of the conflict, but they were not appreciated at first; and it may be interesting to note how they came to be recognized as a result of severe experience.

The new conditions of warfare were novel even to our most experienced soldiers. Part of our officers had participated in the Mexican campaigns of Scott and Taylor; but that war was one of flint-lock smooth-bore muskets, and it belonged to the epoch of Waterloo, rather than that of Gettysburg. A few of our officers had had some experience with the new rifles in Indian campaigns, but here again the circumstances were totally different from those that were to be encountered in the contest of great armies in the War of Secession. The Crimean War and the Italian campaign, had to a certain extent foreshadowed the new conditions, but had presented no satisfactory method of meeting them.

Even a man of the war experience, the military erudition, and the perspicacity of Jomini was groping in the dark. He recognized that a new era of warfare was dawning; but though he derided the visionaries who would have restored to the infantry "the helmets and breastplates of the fifteenth century," he was far from finding a solution of the problem in the intrenching tool. We had, then, not only to create our armies, by organizing and instructing brave and patriotic civilians in the duties of a soldier, but we had to encounter certain military problems, which had not yet been solved in any other armies,

and for which we could find no guide except our own dear-bought experience.

To be sure, we had in our own history many precedents, and not a few glorious traditions, in regard to the use of intrenchments; but we were now confronted with the necessity of making a great invasion, in which military considerations and the temper of our people alike forbade the separation of the strategical and the tactical offensive. Moreover in the Southern States, the natural aggressiveness of the people, their confidence in their own prowess, and the knowledge on the part of their leaders that they could never win with a passive defensive, caused the question of hasty intrenchments on the field of battle to pass at first without serious consideration. As a result, we find the first battle, Bull Run, fought without intrenchments on either side. At a later period in the war, under the same conditions, McDowell would undoubtedly have intrenched his left, at Centreville, and thus being able to hold that part of his line with smaller numbers, would have strengthened his right and thrown a heavier force against the Confederate left. So too, at a later period of the war, the Confederate position would have been intrenched, and the difficulty of the attack would have been greatly augmented; but the value of intrenchments was not understood by the Confederates, and their lack of knowledge was reinforced by an aversion to labor. "The Confederate army," says General Beauregard, "was filled with generous youths who had answered the first call to arms. For certain kinds of field duty they were not as yet adapted, many of them having at first come with their baggage and servants; these they had to dispense with, but not to offend their susceptibilities, I then exacted the least work from them, apart from military drills, even to the prejudice of important field-works, when I could not get sufficient negro labor; they 'had come to fight, and not to handle the pick and shovel,' and their fighting redeemed well their shortcomings as intrenchers. Before I left that gallant army, however, it had learned how readily the humbler could aid the nobler duty."

At Lexington, Missouri, September 20, 1861, the Confederates under Price, who had invested a United States force under Mulligan, saturated bales of hemp with water and rolled them

to the front as movable breastworks as they closed in upon the beleaguered garrison. This admirable bit of tactics was, by the bye, evidently the inspiration of plain untrained military common sense; for experienced soldiers and educated officers were rare in Price's army almost to the degree of non-existence.\* But though these untutored warriors readily appreciated the value of shelter from modern musketry, they were far from grasping the true idea of the hasty intrenchments with which they afterwards became so familiar.

In 1862, McClellan was delayed a month at Yorktown by an inferior Confederate force which occupied a strong line of field-works, and he encountered a line of redoubts at Williamsburg which were easily captured. He caused redoubts to be constructed by his engineers, which partly protected his position at Fair Oaks, and the front of his army before Richmond was slowly and with much deliberation covered with field-works of strong profile. But it was not until the battle of Gaines' Mill that we find any hasty intrenchments in the proper acceptation of the term. In that battle General Fitz John Porter, being compelled to hold a long line with a small force, made an urgent appeal to his chief for axes. The desired tools did not arrive until they were too late to be of any use; but in the meantime, with a few axes borrowed early in the day from the artillery, trees were felled along a small portion of Porter's front and slight breastworks were constructed of logs, rails and knapsacks.

---

\* McBride's command which comprised a very considerable part of the Confederate force is thus described by an officer who served with it: "They had come from the hill country lying to the south and south-east of Springfield and were a unique body of soldiers. Very few of the officers had any knowledge whatever of military principles or practices, and only the most superficial experience in company tactics. The staff was composed chiefly of country lawyers who took the ways of the court-room with them into the field. Colonels could not drill their regiments, nor captains their companies; a drum and a fife—the only ones in the entire command—sounded all the calls, and companies were paraded by the sergeant's calling out, 'Oh, yes! Oh, yes! all you who belong to Captain Brown's company fall in here.' Officers and men messed together, and all approached McBride without a salute, lounged around his quarters, listened to all that was said, and when they spoke to him called him 'Jedge.' Their only arms were the rifles with which they hunted the squirrels and other small game that abounded in their woods, but these they knew how to use."

Hasty intrenchments in the true sense of the term had at last made their appearance. Porter's slight barricades were, it is true, quite insignificant when compared with the works quickly constructed by the opposing armies on the same ground two years later, but they were the germ of the works so universally found on American battle-fields in the later stages of the war. But though the value of hasty intrenchments would have been great in the succeeding battles of the Change of Base, and though the Army of the Potomac, in its retreating conflicts, made use of rail fences and the accidental shelter of the ground, the lesson of hasty fortifications had not been learned; for at the second battle of Bull Run we find both armies fighting desperately without availing themselves of the powerful auxiliary that could have been so readily found in hasty intrenchments. Yet this very battle gave a striking object-lesson in this respect which doubtless sank deep into the memory of officers and men. At Groveton, on the first day of the battle, Jackson's main line rested on the excavation of an unfinished railroad, which constituted virtually the best kind of ready-made intrenchments, and the most determined attacks on the part of the Federal troops were unable to carry it.

It would seem that the value of this lesson would have been so apparent to the Confederates that their next defensive battle would find them resorting largely to the use of hasty intrenchments; but little use seems to have been made by them of any shelter except that afforded by the accidents of the terrain. On the Confederate left a part of the line was protected by a sunken road, a wood in which were outcroppings of limestone affording welcome shelter, a stone wall, and (some authorities say) a breastwork of rails. But, in the main, the Confederate line was unsheltered by natural cover, and Lee had neglected the aid of intrenchments in a struggle in which he was forced to play the part of a Wellington without a Blücher, but in which, fortunately for him, he was not opposed by a Napoleon.

In the West the Confederates, at Fort Donelson, had covered their main work with an advanced line of trenches, the position being practically an intrenched camp. The battle was, in the main, a sortie, in which the Confederates taking the offensive with their left abandoned the shelter of their intrench-

ments, and so weakened their right as to enable Grant to attack the lines successfully at that part of the field.

At Shiloh the first desperate and bitter struggle of the war, where, as Lannes said of Montebello, the bones crashed like glass, no use was made of intrenchments; though, according to General Sherman, the position could, at a later period of the war, have been rendered impregnable in a single night. Though the pick and spade had been but little used in the West, General Grant tells us, in his memoirs, he had taken the subject of intrenchments under consideration soon after resuming command in the field, but his only military engineer had reported unfavorably upon the project. "Besides this," he says, "the troops with me, officers and men, needed discipline and drill more than they did experience with the pick, shovel and axe. Reinforcements were arriving almost daily, composed of troops that had been hastily thrown together into companies and regiments—fragments of incomplete organizations—the men and officers strangers to each other. Under all these circumstances I concluded that drill and discipline were worth more to our men than fortifications." General Sherman says: "We did not fortify our camp against attack because we had no orders to do so, and because such a course would have made our raw men timid."

With all due respect to the illustrious commanders quoted above, these reasons do not seem to be at all adequate. If the men were untrained and undisciplined, if their organization was imperfect, and officers and men were strangers to each other, there was all the more reason why the raw troops should have been given the physical and moral support of intrenchments in a camp which they were expected to occupy for some days. If the position could have been quickly made impregnable, the loss of time from drill would have been very slight; and as to the men being made timid by the use of intrenchments, it may be well questioned whether the troops would have fought less stubbornly if they had been protected by breastworks while their assailants were in the open. The true reason, it seems to me, is expressed in the words of General Grant, that the pick and spade had not yet been used to any extent in the West; and he and Sherman doubtless neglected

the use of intrenchments for the same reason that Lee did, a few months later, at Antietam; namely, that the utility of hasty intrenchments on the field of battle was not yet appreciated. After Shiloh we find intrenchments not only used, but grossly abused in the snail-like advance of Halleck from Pittsburg Landing to Corinth, an advance in which for a month he dug his way towards the stronghold of his opponent, twenty-three miles distant, only to find that opponent eluding his tardy grasp and leaving to him, as the fruit of his labors, an insignificant Mississippi village. It seems like the veriest sneer of a mocking fate that people regarded this barren capture as having some resemblance to the magnificent strategy of Napoleon at Ulm, and that the Federal Administration rewarded the dilatory digger with the command of the armies of the United States.

The value of the spade and the axe was, however being impressed upon the minds of officers and men in the American armies as a result of their bitter experience. At Corinth on October 5, 1862, we find the Confederates making a desperate and unsuccessful attempt to capture earthworks that had been constructed by the Federals. Here again we may well quote from General Grant: "The battle of Corinth was bloody; our loss being 315 killed; 1813 wounded; and 232 missing. The enemy lost many more. Rosecrans reported 1423 dead, and 2225 prisoners. We fought behind breastworks, which can, in some degree, account for the disparity." These breastworks were, it is true, semi-permanent field-works, that had been constructed by Halleck before he left the West; but the disparity of loss and the comparative ease with which the Federal troops repulsed a gallant assault, gave to every private soldier in the ranks, especially when coupled with his experience at Shiloh, a practical and forcible lesson in fortification.

At Stone's River the Confederates intending to assault with their left, fortified their right and centre against a counter attack, which Rosecrans, in fact, had intended to make, and which he would have made, had not Bragg, by his superior readiness, seized the initiative. Rosecrans, after being forced into a new position by the doubling up of his right flank, made use of intrenchments at some parts of his line. The Confeder-

ates intrenched in their new position also ; but the force of the Confederate attack was completely spent in Breckinridge's assault on the Union left ; after which neither army had the temerity to assault the intrenchments of the other ; and, as a result of this bloody but peculiar battle, Bragg finding that his adversary would not leave the field, and could not be driven therefrom, felt compelled to withdraw himself. The education of the men in regard to intrenchments was manifestly progressing.

At Fredericksburg Burnside attacked a position which Lee had fortified with great care and deliberation. The Confederate left was, from the nature of the terrain, practically unassailable. Marye's Heights farther toward the centre rose with a comparatively gentle slope from the plain in front, and at the base of the hill there was a sunken road, on the side of which, next to the town, was a stone wall, shoulder high, covered with a natural embankment of earth, left by the cutting of the road. The ground had been carefully examined by the Confederate officers, all of the details of supply of ammunition, provisions, water, etc., had been carried out ; and, in the language of General Alexander, Longstreet's Chief of Artillery, "The ground was so well covered that the Confederate fire could comb it as with a fine tooth comb." On the right, where intrenchments had not been resorted to, a railway with a friendly cut and embankment answered the purposes of defense admirably. Against this impregnable position the valor of the Army of the Potomac dashed itself to pieces, as waves are dashed into spray against a rocky coast, and a new lesson, and a bitter one in regard to the value of intrenchments, had been taught to the Army of the Potomac.

Yet this lesson, oddly enough, was strangely perverted in the next great battle. Hooker who had observed with his own eyes the futility of assaulting the intrenchments at Fredericksburg, had evidently formed an exaggerated idea of their value ; for, after his masterly passage of the Rapidan and the Rappahannock, we find him abandoning a most promising offensive, in order that he might deliberately intrench a defensive position. There was no doubt as to the strength of the Federal intrenchments at Chancellorsville. General Howard thought the breast-

works of Schurz and Devens unusually well built ; and General Hooker, as he inspected the barricade remarked, "How strong ! how strong !" But great though the aid of field intrenchments is to the defensive, they cannot compensate for a lack of skill or a lack of resolution on the part of a commander. The intrenchments of the 11th Corps were not proof against surprise and flank attack, and the result of the battle at Chancellorsville might justify us in including intrenchments with men in Napoleon's famous aphorism, "In war men are nothing, a man is everything."

At Gettysburg less use was made of intrenchments than it would seem should have been the case. The Federal army on the defensive was sheltered to a considerable extent by stone fences, and some slight use was made of intrenchments ; but the line, as a whole, was very imperfectly and only partly strengthened with artificial shelter. After Lee's repulse, he hastily fortified a line from Oak Hill to Peach Orchard, and while preparing for his retreat, defiantly awaited any counter attack that his victorious opponent might make. "A careful survey of the enemy's intrenched line after it was abandoned," says General Hunt, "justified the opinion of the corps commanders against an attack, as it showed that an assault would have been disastrous to us." A more striking demonstration of the enormous advantage of hasty intrenchments over an open defensive could scarcely have been given.

In the West the object lessons in the art of fortification were continued in 1863, though the instruction was not yet complete. At Chickamauga, Thomas' men, at the close of the first day's fight, strengthened their position with barricades of logs and fence-rails ; but, considering the desperate nature of the struggle, surprisingly little use of hasty intrenchments was made by the Union army. In the Vicksburg campaign the value of intrenchments was demonstrated in a striking degree, when Grant after repeatedly and heavily defeating the forces of Pemberton in the open field and driving them in rout into Vicksburg, met with a severe repulse at the hands of his recently beaten foe, now sheltered by intrenchments, and found it necessary to resort to the slow operations of a regular siege. At Chattanooga the Union army left its intrenchments to attack

the enemy in a fortified position; and owing to the numerical superiority of the Federal forces, the intense spirit of rivalry engendered by the union of troops from three different armies and three distinct theatres of operations, and to the location of the Confederate batteries on the crest of a slope so high and steep as to render an effective fire impossible, the attack was more successful than direct assaults upon intrenched positions can usually hope to be.

In the last operations of the year in the East, the Army of the Potomac confronted Lee's army at Mine Run. The Confederate position, which was one of great natural strength, was rendered still more formidable by trenches and breastworks, and by an abattis formed by felling a thick growth of pine trees. The nature of the position was well understood by those who confronted it, and Warren wisely assumed the responsibility of suspending the attack. "The time had not been seen," says Swinton, "when the Army of the Potomac shrank from any call of duty; but an unparalleled experience in war, joined to a great intelligence in the rank and file, had taught these men what, by heroic courage, might be done, and what was beyond the bounds of human possibility. Recognizing that the task now before them was of the character of a forlorn hope, knowing well that no man could here count on escaping death, the soldiers, without sign of shrinking from the sacrifice, were seen quietly pinning on the breast of their blouses of blue, slips of paper on which each had written his *name!*"

When the campaign was opened in the spring of 1864 the lesson of hasty intrenchments had been well learned. Our levies of raw recruits had been converted into war-seasoned veterans; and from the Potomac to the Mississippi there was scarcely a soldier who did not appreciate from his own experience the enormous power given to the defensive by intrenchments that could be easily and quickly constructed. Moreover, the intelligence of the men in the ranks and the wide dissemination of military news had rendered the armies in the East and West each familiar with the experiences of the other. Educated officers who were familiar with the history of European wars recognized the fact that neither the Old Guard at Waterloo nor the Russian columns at Inkerman had to cross so wide a fire-

swept zone as that which the assailant now had to traverse to reach the hasty intrenchments which sheltered the defender; they appreciated the fact that a new problem demanded a new solution; and they understood that if the assailant would not recoil, altogether baffled, from a desperate attack he must by the use of intrenchments hold fast to such ground as he might be able to gain to the front. The use of hasty intrenchments as an element of the offensive as well as the defensive was accordingly understood, and it was soon to receive a striking exemplification.

The campaign of 1864 was essentially one of intrenchments in every part of the extended theatre of our war. On June 23d of that year Sherman telegraphed to Halleck: "We continue to press forward on the principle of an advance against fortified positions. The whole country is one vast fort, and Johnston must have at least fifty miles of connected trenches, with abattis and finished batteries." In Virginia hasty intrenchments were as prominent a feature as they were in Georgia, and in the struggle between Grant and Lee we find them used on every field. Their employment had become the rule, their absence the exception, and they had now reached their highest development. They were by no means uniform in profile or in trace. As regards the former, nothing was sought but speedy and efficient shelter; and as to the latter, while flanking fire was provided wherever practicable, it was recognized, either consciously or unconsciously, that the increased danger zone diminished the necessity for flanking fire so imperative with the short-range arms of former days.

The method of constructing the intrenchments was simple and speedy. If in an open country, the earth was generally thrown up quickly from a ditch on the inside, the soldier thus expediting his work by raising his shelter and sinking his own position at the same time. If in a wooded region, trees were felled and a timber revetment about four feet in height was constructed, against which the earth was embanked from a ditch on the outside. If artillery fire was likely to be encountered, or if a prolonged occupation of the position rendered it practicable to strengthen the intrenchments, the works were often of strong profile, being sometimes as much as thirteen feet thick at the

base and ten feet thick at the superior slope. The front was usually covered with a thick and strong abattis, made by slashing the trees so that they fell towards the enemy, thus forming an obstacle through which an assailant could penetrate with difficulty, and which would hold him for some time under fire even if he should succeed in reaching it. As a rule no other obstacles than the abattis were used, though in some of the more important intrenchments of the Confederates *chevaux de frise* in front and sharpened stakes in the ditch were used.

The breastwork was surmounted by a head-log resting on supports so adjusted as to give a horizontal loophoole about three inches in height between the log and the embankment. If subjected to artillery fire the head-log was sometimes misplaced by a cannon shot and thrown over upon the men behind the intrenchments. Some genius among the Confederates accordingly devised a system of skids of sufficient strength and proper inclination to enable the log to slide harmlessly to the ground when knocked from its place by an unfriendly projectile. This device would seem to be a bit of "Yankee ingenuity" more appropriate to the Northern army; but though it was the invention, as far as I can learn, of a soldier in gray, there was no patent law or moral obligation strong enough to prevent its adoption by the Federal troops as soon as a single captured head-log with skids had disclosed the new idea to a quick-witted enemy. As a result the device was quickly adopted throughout the armies of the North as well as those of the South.

The intrenchments at especially important points were sometimes planned by engineer officers and constructed under their supervision; but as a rule they were entirely the work of troops of the line. After a hasty reconnaissance of the ground to be occupied, the division commander assigned to each brigade its place in the general line selected, and the command moved forward to the designated position preceded by a skirmish line. When the command halted the skirmishers remained in front, while the main body stacked arms and set to work on the intrenchments, with such energy and skill that General Howard declares he has known a regiment to shelter itself completely, with axes and shovels, against musketry and artillery in less than hour after it reached its position. General Cox

bears similar witness to the intrenching ability of our soldiers in 1864. "Even our skirmishers," says General Sherman, "were in the habit of rolling logs together, or of making a lunette of rails with dirt in front, to cover their bodies."

The intrenching tools were generally carried with the ammunition train, though not infrequently, axes and shovels were carried by the men. No regular intrenching tool had yet been devised, though in cases of emergency, if better tools were not available, the men used bayonets, halves of canteens, tin cups, jack-knives, spoons, and even their finger-nails, in scraping up earth to shelter themselves from the enemy's fire. Indeed, it was not always that the works could be thrown up in anticipation of an attack; on the contrary, they were often constructed under fire in the heat of actual battle. At Mud Creek, Georgia, Baird's division, in a comparatively open field, threw out a heavy skirmish line which kept up a rapid and accurate fire while the main line constructed "a good set of works" parallel to the enemy's intrenchments and only four hundred yards from them. In the History of the Fifty-fifth Illinois Infantry is the following vivid picture of the manner of seizing and intrenching a position under fire, which is all the more interesting because it is mentioned as a mere incident in one of the actions in front of Atlanta: "The point to be gained was about three hundred yards in advance of the main Union line, and about the same distance from the intrenched position of the enemy. The advance was gallantly made across open ground the whole of which was swept by an enfilading fire from the skirmishers in the rifle-pits on the right. The rebel batteries in the main line also kept up a vigorous bombardment of the position we were aiming to reach. The summit was speedily gained, and with astonishingly small loss; for experience had taught the veterans how to move rapidly while hugging the ground closely, and to take advantage of every inequality. The grass, moreover, though scanty, was tall enough to seriously interfere with the rebels' aim. Upon arrival at the desired point, a few minutes sufficed to dig burrows for individual protection. We lay upon face or back in the roasting rays of the afternoon sun, slowly sinking ourselves into shallow pits to avoid the shower of balls that hissed

a foot or two above us ; and when darkness came these little pits were enlarged into a continuous trench with a traverse embankment upon the exposed flank."

The physical and moral strength given to an army by the use of hasty intrenchments was great and positive, though not easily measured. General Cox says that one man in the trenches was equal to three or four in the assault, and General Humphreys has recorded his opinion that with such intrenchments as those that were habitually used in Virginia in the latter part of the war "the strength of an army sustaining attack was more than quadrupled, provided they had force enough to man the intrenchments well."

Almost every battle in the latter part of the war illustrates this increase of defensive power conferred upon an army by the use of hasty intrenchments. Sherman assaulted the intrenchments of Johnston at Kenesaw Mountain with no other visible result than a comparatively slight loss to the defenders, and a ghastly "butcher's bill" on the part of the assailants ; and, when Hood, urged on by the authorities at Richmond, threw himself against the Federal intrenchments, the conditions were completely reversed.

Speaking of the battle of Ezra Church, Sherman says : "In conversation with me, the soldiers of the Fifteenth Corps, with whom I was on the most familiar terms, spoke of the affair of the 28th as the easiest thing in the world ; that, in fact, it was a common slaughter of the enemy ; they pointed out where the rebel lines had been, and how they themselves had fired deliberately, had shot down their antagonists, whose bodies still lay unburied, and marked plainly their lines of battle, which must have halted within easy musket-range of our men, who were partially protected by their improvised line of logs and fence rails. All bore willing testimony to the courage and spirit of the foe, who, though repeatedly repulsed, came back with increased determination some six or more times."

At Spottsylvania the only lodgment made in the Confederate works was a scene of gruesome carnage almost without parallel, and at Cold Harbor the attack upon Lee's position was one of the most mournful exhibitions of fruitless courage that can be found in the annals of war. With characteristic candor Gen-

eral Grant has recorded his regret that the last assault at Cold Harbor was ever made, and has stated that no advantage whatever was gained to compensate for the heavy loss sustained. Yet I am able to state, on the authority of an officer then on the staff of the Confederate President, and who was with the headquarters of the Army of Northern Virginia at the time, that this battle, so brief yet so bloody for the Union forces, was not at first regarded by General Lee as anything more than a slight action—scarcely more than a mere reconnaissance in force.

Bearing in mind the skill of the troops in constructing hasty intrenchments and the augmentation of defensive power conferred by such works, the strategy and tactics of the latter part of the war follow as a natural corollary to the new proposition in warfare. It was not merely because there was a greater unity of command than at former periods of the war; not merely because the armies were directed with a higher order of generalship; not only because the meddlesome influence of civil officials had, through sad lessons, been reduced to a minimum, that the military operations were now conducted with a continuity and persistence formerly unknown. It was largely due to the altered conditions brought about by the universal use of intrenchments. The armies were no longer in the presence of each other for only a few days at a time; and it was no longer possible to turn a repulse into a decisive defeat by a successful *riposte*, for a counter attack now gave to the enemy the advantage of an intrenched defensive, of which the veteran troops were fully able to avail themselves. It followed from this condition that battles rarely produced quick decisive results, but became contests not of days but of weeks. The Atlanta campaign was almost a continuous battle from Dalton to Jonesboro, and Blair officially reported that his corps, which seems to have had no different experience from that of the others, was occupied at one period of the operations for 28 days in making approaches, digging rifle-pits and erecting batteries, being subjected day and night to a galling fire of artillery and musketry.

To Sherman is due the credit for first adopting a strategic use of hasty intrenchments thoroughly in accord with the genius of modern war. The great danger in executing a turning move-

ment, as every military student knows, lies in the fact that if it be made with the heavy force necessary to insure success, the weakened portion of the army remaining in the enemy's front may be overthrown by a counter attack. Sherman, recognizing the value of hasty intrenchments on the defensive, intrenched his stationary corps so as to render them secure, and threw a formidable turning force around the enemy's flank. To meet this turning force with superior numbers would cause a fatal denuding of the trenches in front; to attack it with inferior numbers would simply mean defeat; while to stand on a passive defensive would be a suicidal sacrifice of vital communications and necessary lines of retreat. As a result, Sherman's movement succeeded time and again; Johnston was compelled to abandon position after position that would have been impregnable to direct assault; and, finally, his successor, Hood, finding an intrenched enemy in his front and a superior force on his flank, had to abandon Atlanta itself. Sherman's strategy had all the simplicity of genius. "In war," says Clausewitz, "everything is simple; the difficulty is to obtain the requisite simplicity."

For a period greater than that during which the hostile armies confronted each other at Sebastopol, the forces of Grant and Lee were locked in constant combat, fighting and intrenching, all the way from the Wilderness to Petersburg, the Confederate line of intrenchments actually held in the spring of 1865 being thirty-seven miles in length, "not measured along the irregularities of the general line of intrenchments, much less along that of the parapet line." During the campaign the marching was done chiefly at night, the opposing lines were in almost constant contact, and the firing was incessant. So closely, in fact, did the hostile lines approach each other that in some cases they were not more than 150 yards apart, the opposing sentinels being separated by a space not more than one-third of that distance. At Cold Harbor the lines were so close that an attempt to establish outposts brought on a sharp skirmish in which each side thought the other the attacking party.

Grant's strategy was simple, and admirably adapted to the new conditions. Recognizing from bitter experience the folly of attempting to carry Lee's intrenched lines by direct assault,

he reached out to his left to cut the Confederate communications with the South, well knowing that his own intrenchments rendered him perfectly safe from counter attack. The quadruplication of the strength of the defenders depended, as General Humphreys says, upon there being a sufficient number of men to man the intrenchments well. With his superior numbers Grant could continue to extend his lines without losing his defensive power, until the Confederate lines could either be turned or so denuded of men as to lose their defensive strength through sheer attenuation. The problem was one for which he had no precedent and no guide, but he solved it with the plain common sense characteristic of the man.

From the Potomac to the Rio Grande the only theatre in which intrenchments were not habitually, and indeed continuously, used was the Shenandoah Valley. In that region Fisher's Hill and Cedar Creek were the only fields in which intrenchments were thrown up. Why this was so, I am not informed. Certainly it was not because of the large proportion of cavalry, for that arm constituted less than one-fifth of Sheridan's entire force; and, moreover, the use of hasty intrenchments by cavalry was by no means a thing unknown. Fitzhugh Lee had secured the important point of Spottsylvania for his chief, by pushing forward rapidly with his cavalry and intrenching across the Brock road, thus barring the Union advance; and a few weeks later the Union cavalry under General Merritt seized the important position of Cold Harbor, and, hastily intrenching, held it against a determined assault of the Confederate infantry until the arrival of the Sixth Corps secured it for the Union forces. It would seem that these instances, even if they could not have been strengthened by a score of others, would have impressed upon Early the enormous benefit that could have been derived from intrenchments by his force so inferior in numbers and in arms. But, whatever the cause, the campaign in the Shenandoah stands out as a unique exception to the rule of intrenching so general in 1864.

The moral influence of intrenchments must not be left out of consideration. General Sherman says: "The habit of intrenching certainly does have the effect of making new troops timid. When a line of battle is once covered by a good para-

pet, made by the engineers or by the labor of the men themselves, it does require an effort to make them leave it in the face of danger ; but when the enemy is intrenched, it becomes absolutely necessary to permit each brigade and division of the troops immediately opposed to throw up a corresponding trench for their own protection in case of a sudden sally." Hood, when he invaded Tennessee, feared, after an advance of 180 miles, that he should be unable to get the Confederate troops to fight unless under the protection of breastworks. Yet Sherman's men had become habituated to the use of intrenchments before their gallant attack upon Kenesaw ; the Fourteenth Corps had been long accustomed to fighting behind breastworks before the handsome capture of the Confederate intrenchments at Jonesboro ; and Hood's own men, about whom he felt such solicitude, and Schofield's men, who were equally habituated to fighting behind intrenchments, fought at Franklin one of the fiercest hand-to-hand conflicts of modern times.

It is an interesting psychological fact that the troops everywhere seemed to defend intrenchments that had been made by themselves with more stubbornness than those that had been constructed for them. Indeed, it is only in the earlier stages of the war that we find intrenchments constructed by engineer troops for the other arms, and then the soldiers who manned them generally insisted on giving the works the finishing touches themselves. At Fredericksburg, we are told, the Confederate engineers constructed redoubts for the artillery, which failed to satisfy the troops detailed to occupy them. The men accordingly went to work with pick and shovel to alter them to their liking. The engineers protested that they were "ruining the works," but the cannoneers replied, "We have to fight here, not you ; we will arrange them to suit ourselves." It was a characteristic feature of the war that the same men built and defended the intrenchments, which had in fact grown to such an enormous extent that they would have overtaxed the working capacity of the engineering troops of half a dozen military nations.

Hasty intrenchments being so clearly the outgrowth of the new conditions of war, it would naturally be expected that they would make their appearance in the next contest between great

armies; but most of the lessons of the War of Secession were persistently and almost contemptuously ignored by foreign military critics until they had been approved with the stamp of European experience. There was everywhere on the part of German critics a tendency to regard our war as a mere *Bürgerkrieg* carried on by untrained levies under the guidance of improvised generals; France, before her military humiliation in 1870, was too self-satisfied to heed military lessons from across the sea; and there were in all Europe few soldiers like the gifted Chesney, who had the wisdom to recognize that "if a man's claims to be regarded as a veteran are to be measured by the amount of actual fighting he has gone through, the most seasoned soldiers of Europe are but conscripts compared with the survivors of that conflict." As a result of this ignorance, the hasty intrenchments so generally used were regarded as being altogether due to our wooded terrain, or to the defensive instincts or the offensive incapacity of raw levies; though, in point of fact, such works were found alike in the forests of Spottsylvania and the open ground of Franklin, and it was not our undisciplined forces but our war-seasoned armies that fought behind breastworks.

Hasty intrenchments were not used in the Austro-Prussian War, though their use by the Austrians would have gone far towards neutralizing the advantage conferred upon the Prussians by the needle gun. They had not learned the lesson from abroad, and the war was of too short duration for them to learn the art of intrenching from their own experience.

In France there were many opportunities for the profitable use of hasty intrenchments, notably at Woerth, where the defense of the village of Froeshweiler by a French brigade against the frontal attack of a German army corps showed what McMahon might have accomplished had his whole position been intrenched; and at Gravelotte, where the Prussian Guards had a Fredericksburg experience with modern rifle fire, the sun might have set upon a field of French victory had Bazaine taken heed of the lesson so plainly taught in the American War. But, like the Austrians, the French had not learned from the experience of others, and they were crushed before they could profit by their own.

It was not until twelve years after the close of the War of Secession that hasty intrenchments made their appearance in European campaigns, and American tactics had their vindication in the methods of Osman Pasha and Skobelev. Before the end of the Russo-Turkish War the lesson had been well learned by both combatants; and referring to the march of Skobelev's division from Plevna to Constantinople, Greene says: "Every man carried an implement of some kind, about 85 per cent. being spades or shovels, 10 per cent. picks, and the rest axes, etc. His division marched with these on their backs from Plevna to Constantinople; they were slung over the back, the handle projecting above the left shoulder and the spade below the right hip, and were attached to the shoulder with a piece of string, a strap, a piece of old tent, or anything else that was available; they were heavy (weighing over 5 pounds), they were uncomfortable, they were in every way inconvenient, but each man had learned by hard experience to feel that his individual life depended upon his musket and his spade—and he took good care to lose neither the one nor the other."

The intrenching tool, in some form, is now a part of the equipment of the soldier in all civilized armies. It is the logical reply to the improvements in fire-arms, and is scarcely less important than the rifle itself. Any army standing on the defensive will intrench; and the assailant, well knowing the difficulty of a front attack, will bend all his efforts toward turning a flank, covering his own front with intrenchments to resist a counter attack. The tactics of Austerlitz will probably be rarely seen in future; rather a modification of the tactics of Salamanca or Dresden, or a repetition of that of Königgrätz or Gravelotte. Frontal attack will, however, still be often necessary if only to hold the enemy while the attempt is made against his flank. Of such attacks von der Goltz says: "The central attack will no longer present the character of a single shock. It will be rather a long work of penetration, interrupted by pauses, and carried forward by fresh troops. It will be necessary during the pauses to secure the conquered ground by means of hasty intrenchments, so that we may say it will be a case of one position advancing against another. Frontal attacks on a great scale will have in their general aspect a similar character and will last

several days. It is not difficult to foresee the losses they will cause. It can be easily foretold that the future will present a series of episodes similar to those of the 14th to the 18th of August, 1870, following each other in succession." Another great German military writer, Hoenig, says: "The armor shields and armored clothing prepared by the Danes and others, do not seem suitable for field service as protection against projectiles, but, on the other hand, the construction of rifle trenches, etc., by means of the spade will play a great rôle in future battles; occasions for their use will arise for the attacker as well as for the defender, since it is very probable that there will be battles of several days duration—which are nothing new, however. In this connection it is sufficient to recall the North-American Civil War."

In conclusion it may be said that hasty intrenchments were not the outgrowth of our peculiar terrain or the nature of our troops, but that they were the logical and inevitable result of new conditions of war; that they would have arisen in any war of sufficiently long duration to enable the combatants to profit fully by their own experience; and that the War of Secession pointed out the tactical future more clearly than either of the great German wars, more clearly indeed, in some respects, than any war that has since occurred.

The art of constructing and using hasty intrenchments on the field of battle is a contribution from America to the war knowledge of the world.

## THE NEW CARBINE AND THE NEW TARGET PRACTICE.

BY CAPTAIN E. A. ELLIS, 8TH U. S. CAVALRY.

THE United States have joined the procession of nations who believe that their salvation lies in magazine guns and smokeless powder, and have definitely committed themselves to the manufacture and issue of the Krag-Jorgensen rifle and a carbine made on the same general system.

The history of this arm is as follows: A Board on Magazine Small Arms was convened by General Order No. 136, Headquarters of the Army, A. G. O., November 24, 1890, which began its sessions December 16, 1890, and submitted its report in September, 1892.

After a careful and uniform test of all the 53 guns presented, "the Board selected the model known as the Krag-Jorgensen No. 5, as possessing the best magazine system presented, and as a suitable and satisfactory system to be adopted by the United States military service. This arm can also be used as a single loader, and the Board finds that as a single loader it is the best arm that was presented."

The report of the Board was approved, and a Board of Ordnance officers was appointed with "instructions to make a study of and to recommend a suitable calibre for the new rifle, and suitable rifling, sights and ammunition, besides the bayonet ramrod, and other appendages required for issue with the rifle and carbine."

The Chief of Ordnance took advantage of the work of the Magazine Gun Board to get a report of the sights and bayonets used on foreign arms. This was easy to do, for the Board examined and tested arms that have been officially adopted by the following countries: Austria, Belgium, Denmark, England, France, Germany, Japan, Portugal, Switzerland, Russia and Roumania. The Chief of Ordnance says: "It is a distinguishing feature of the sights as compared with our own service sight that none are adapted for accurate target shooting, nor would they prove satisfactory for sharpshooters' use in action. The

rear sights are generally adapted only for fixed elevations, and have no arrangements by which compensation can be made for windage or drift allowance, and for ordinary ranges only the plain open notch, either square or V-shaped is provided."

All this information is taken from the report of the Chief of Ordnance for 1892.

From his report of 1893 I get the following: "The sights of the rifle are designed more for use in war than for the special use of the target ground, as it is wise to provide a sight which will be used by the soldier at all times in the same manner as in battle, though a certain number of rifles may be provided with telescopic sights for special organizations. It is simple in construction and manipulation, and strong and durable."

The following is obtained from his report of 1894: "Some of the rifles that have been issued did not embody the latest changes in the sights. Complaints have been received that the sights were not graduated for range shooting, or arranged to compensate for drift, and besides have no wind gauge. Opportunity will be taken to exchange the small number of sights having any defects which have already been sent out for those in which the sight has been corrected by later experiments at the armory. The sight notches on the leaf and slide are placed to the left of the axis of the bore, making absolute correction for drift at 500 and 1000 yards and approximate correction at other ranges. The rear sight, for reasons explained in the last annual report, is not provided with a wind gauge."

In the "Description and Rules for the Management of the U. S. Magazine Rifle and Carbine, cal. .30," published in 1894, we find the following: "On the cross-arm (speaking of the rear sight leaf) at the upper end is the sight notch, used when the leaf is down on the base for ranges from 300 to 600 yards. Placed on the left of the axis of the barrel it corrects for the drift at a single distance; 500 yards has been selected; for 300 and 400 yards the drift correction is then slightly in excess of the true amount; for 600 yards it is slightly too small."

From these quotations we are able to gather the information that our carbine was placed in the hands of our cavalry with a sight that was *designedly* made to conform to European models, and one with which accurate shooting is out of the question.

At the present time there are two distinct uses for the carbine. We must at all times have a gun for war equal to any possessed by any nation with which we are liable to be brought into conflict, so that we will not be handicapped by an inferior weapon when we take the field. I am bound to believe that the present carbine answers all requirements on this score, and I think that the Magazine Gun Board deserves the thanks of the entire army for the able and thorough manner in which it discharged its duties, and the exceedingly satisfactory results obtained. We have a magnificent war weapon.

In contradistinction to its war use is its peace use, by which I mean its use as a target arm. It is important that some attention be given to this subject, for the cavalry soldier gives up three months out of every twelve to target practice, and surely a subject that, in time devoted to it, is rated by the War Department as one part to three for everything else, deserves, at least, that all proper appliances be furnished in order that such an important matter may be a success.

There is nothing in the argument that the sights of guns of European nations "are not adapted to accurate target shooting," for these nations are in a state of preparation for war and actively engaged in watching their neighbors, and have no time for the peace uses of their weapons. If the nations of Europe were to propose to give their troops the same amount of target practice ours get, they would soon find that the burden in increased expenses would be too great for them to stand, for it would add in round numbers \$100,000,000 to the annual army expenses of Europe. Target practice like ours, if persisted in for a few years throughout Europe, would produce such financial embarrassment that universal disarmament would be apt to ensue. Such warlike nations, therefore, limit the rifle largely to its war use.

The Magazine Gun Board having selected a foreign gun for introduction into our service, the Ordnance Department has been consistent, and adopted a foreign sight for the foreign magazine system.

Probably there is no subject on which officers of experience and ability more widely differ than on that of the value and efficacy of marksmanship in war. The various views of our own

officers have been given in our military journals, and the whole subject thoroughly discussed. To show how far apart certain officers are, I have selected the extreme views advocated in these articles and will present them without comment. One boldly asserts that marksmanship is of no importance; but that what is wanted is "a stream of bullets, in a horizontal direction, normal to the front"; that is, unaimed fire; while another well supported by good authorities, too, holds that a perfect familiarity with the weapon is, next to discipline, of the utmost importance.

I say that I will limit myself to stating the extreme views without comment. I do this, not because I have not decided views on the subject myself, but because as far as the matter under discussion is concerned, it is immaterial which view is taken.

Each one of us may decide the question for himself, but he will find when the decision is made, that we are still confronted with the question of the two uses—peace and war—for our carbine, and that just now the former is of the greater importance, in being the only one with which we are at present concerned. After twenty years of target practice, we may conclude that it is not the fad that many at first supposed it to be, and that it has come to stay.

We have a rational system and one that is thoroughly enjoyed by our officers and soldiers. I have only words of praise for the new system. It is founded on common sense, and insures a good standard of comparison in its "Proficiency of the Company." Stripped of all chances of loose construction and more or less questionable practices against the spirit, if not the letter, of the old "Firing Regulations," the new ones insure an honest record of all shots fired by the entire company, and give a basis of comparison that is far superior and far more accurate than the former "General Figure of Merit."

Our regiment has just passed through the second year with the carbine and the first with the new Firing Regulations. Unfortunately we have, as yet, no comparisons with other regiments, and cannot tell how we have done. But I am safe, I think, in the assertion that the 8th Cavalry has done relatively as well as in the past, and will be found well up towards the

head in point of merit. At all events the results are satisfactory and creditable to us.

The regiment is, perhaps, exceptional in having almost all of the troop officers sharpshooters and excellent shots, with a thorough knowledge of trajectory and the causes that tend to deflect the bullet in its flight.

We have also in every troop, non-commissioned officers who are good shots and good coaches, men whose dictum is accepted with the utmost deference and with absolute confidence by the enlisted men.

We have also the prestige of fine shooting in the past, and a desire on the part of one and all to keep up the good name of the regiment by doing the very best shooting possible. These have all been elements of our success in the past and were elements of any success we may have had this year.

But I must confess that, because the carbine is "not adapted to accurate shooting," I used myself, and saw others use methods in coaching that I never expected to see used on a target range in our army. Men would be told to aim at "that bunch of weeds" or at "that rock so many feet to the left of the target"—usually with good results. Other coaches after having taught recruits that they must *not* cant the piece, and after having spent years in showing the bad effects of doing this with a wind gauge gun, now made the most of this information and boldly taught the men to cant the piece—almost invariably with good results. I remember one man in particular whom I found going to pieces at 600 yards and whom I made to cant his piece with the result that he qualified at 600 yards, and eventually became a sharpshooter. When he had finished his score at the 600 yard range, I congratulated him on his success, and he replied: "Yes, sir; but it is contrary to everything I have ever been taught." He was an old soldier and had had his early lessons so thoroughly learned that he was incapable of making any such change for himself. By the use of such formerly heretical coaching were sharpshooters made for the regiment.

Now if it were only that we could get good results by adopting new and unusual methods of coaching, I would not have a word to say, and this essay would never have been written; for I can do nothing but praise the new war weapon and

the new target practice, and high praise can be condensed into very few words.

But this is only the smaller part. We are *required* to have target practice. It is imposed on us as a military duty, and like any other military duty, the results have to be as good as we can make them. General Order No. 1 of each year (the one giving the army record of target practice for the year just ended) is carefully read, and everything—professional pride, *esprit de corps*, even an officer's reputation—is involved in a favorable comparison. I can quote orders, if necessary, in which company commanders have been mentioned by the letter of their company and the number of their regiment, and warned that better results must be obtained at target practice, or the Department Commander would take steps to remedy the matter himself.

So we have to continue the hateful task of prodding our men up and of teaching them that which they have hitherto been taught to regard as a heretical and anathematized doctrine—in order to teach them the one great fact, *that the bulls-eye can never be hit with the new weapon by aiming directly at it.*

This statement is a little strong, of course. At the shorter ranges, on an absolutely calm day, with light and moisture just right, and with the present enlarged bulls-eye, one may aim at the figure and occasionally “wobble” into it; but the way I have stated it above is the way this new military axiom is formulated among the men, and is true for all practical purposes.

This is so contrary to what has been taught in the past that a deplorable want of confidence in the new gun is engendered in the old soldiers and, as new men readily take up the views and prejudices of the older ones, it is not too strong an assertion to make that there is a constantly growing lack of confidence in the new gun on the part of the enlisted men. If they have a lack of confidence in it in peace, how much greater will that lack be in the unusual and unforeseen conditions of war? Troops armed with weapons of which they are suspicious, are already whipped; and in battle it will take but few casualties, few groans from the dying, few glimpses at the bloody dead, to change suspicion into panic and flight, and to cause a disgraceful rout to take the place of the expected victory.

Now whence comes this lack of confidence on the part of troops that had unlimited confidence in the Springfield? It comes from that very fact that one has to aim off the target, or at least out of the bulls-eye, in order to hit it—or, in other words, because the guns have no wind gauge. Being founded on common sense and not on a fallacy, this feeling will continue till one *can* hit the bulls-eye by aiming at it; that is, till the carbine is “adapted to accurate shooting.” As the trajectory of this gun is flat, the question of elevation does not enter materially into the considerations of accurate shooting—and the graduations of the rear sight into hundreds of yards will answer well enough; so that all that is necessary is a device by which deviations of the bullet due to wind and drift can be compensated for by lateral changes of the sight notch. Nothing better than the sight that was on the Springfield carbine is desired.

This is all that is needed to make the new gun as nearly perfect as we can get a military weapon for target practice. In thus changing the rear sight and *increasing* the efficiency of the gun as a peace weapon, do we in any way *decrease* its efficiency as a war weapon? I cannot see that we do. A wind gauge would in no way interfere with Major Chester’s “horizontal stream of bullets normal to the front,” nor would it lessen that perfect familiarity with his weapon considered so essential by Captain Parker, the authors of the two views quoted above.

As it is we are required to hold the annual target practice; we are expected to give the greatest attention to the subject and to produce good results; and we are required to use a weapon *admittedly unsuited to its purpose*. This is very discouraging to officers and men striving to do their best, and will end in a decrease of professional pride and zeal for the service on the part of the officer, and has already led to a serious lack of confidence in the gun on the part of the enlisted men. When the full measure of its bad effect is felt, target practice is apt to become a routine duty, and then its usefulness as a military duty will be over, and the men will be more than ever at sea as to the new arm.

A man will sometimes seize an axe and chop a log into firewood, for the fun of the thing and the satisfaction of seeing the chips fly and the pile increase—but he will never consent to

pound the log with the back of the axe, because he does not get the best results. Our military authorities seem to think that target practice is essential; let them, then, give us the means of producing the best results.

Certainly the War Department should do something to remedy a state of affairs that I believe pernicious in the extreme and one that I do not think that I have overstated.

Let it give us the simple thing we are all craving, or, if it finds that the Ordnance Department is too strongly wedded to its foreign sight "not adapted to accurate target shooting," let it modify the present Firing Regulations by striking out all the practice dependent on accurate shooting, substituting therefor a field practice in which the closest approximation to war conditions is insisted on. But far preferably, I say, give us the wind gauge and keep the Firing Regulations as they are.

## REGIMENTAL INSTRUCTION IN FIRST AID.\*

BY SURGEON-CAPTAIN RORY FLETCHER, LONDON, ENGLAND  
CENTRAL LONDON RANGERS (EIGHTH V. B. KING'S ROYAL RIFLES).

TO have been asked to write a paper for the meeting of your Association is an honor, as well as a privilege, for which I desire first to thank you. That you should wish for a statement of the method we employ in the instruction of first aid in the British service is but another evidence of the universal brotherhood which animates our profession, a witness of our desire to pick up any fragment of information that may help us to repair the results of what is now commonly called civilized warfare.

That I shall bring any new ideas to your notice I think unlikely for the teaching of First Aid has now for some years been the constant occupation of doctors both in town and village till a demi-semi-medical knowledge has impregnated all classes,—peer and ploughman, young misses and maiden aunts,—till the forms in which this instruction has been administered vary but as crystals of the same system.

In regimental aid on the field of battle there are two separate points to be considered—the immediate treatment of the wound and the carriage of the patient to a place of safety.

In the dim distant days first aid was performed by the surgeons accompanying the troops, and Hugo of Lucca when sailing with the Crusaders to Palestine received his medicaments and outfit from the good people of Bologna. Some idea of the ratio of the medical staff to the number of troops, at that period, is furnished by the record of the army of 30,000 men who sailed from Southampton on August 11, 1415, under Henry V. The medical officers on that occasion consisted of a surgeon general, Thomas Morestede; a physician, Nicholas Colnet, and twelve assistant surgeons. A chariot and two wagons were given them for baggage. This may appear very inadequate provision for an army of 30,000 men, but we must remember the world had

\* Presented at the Seventh Annual Meeting of the Association of Military Surgeons of the United States, at Columbus, Ohio, May 26, 1897.

not yet arrived at the era of international law and civilized warfare, and that the number of wounded was probably not so great as the enormous slaughter of some of the mediæval battle-fields would lead us to suppose. The hand-to-hand fighting of the day, with the *arme blanche*, raised the proportion of dead to wounded; besides other factors which no longer operate. Take Agincourt, for instance, where 10,000 French are said to have been killed. Henry, during the alarm of an attack on what has been called "the poys and paggage," ordered the French prisoners to be slain.

We'll cut the throats of those we have,  
And not a man of them that we shall take  
Shall taste our mercy.

So likewise the day after the battle, all the French wounded found on the field and considered incapable of paying ransom were murdered in cold blood—an atrocity which history informs us was common in the 15th century. These arrangements must have simplified the labors of Thomas Morestede and his companions and have left Henry no uneasiness as to the future mobility of his army.

It was the barber surgeons who generally accompanied the armies. In the 15th century we find that the contingent supplied by each German town was provided with a *Feldscheerer*, pharmacies and hospital wagons. The German regulation of the period was that each *Stauffen* of infantry, a body of 5000–10,000 men, had its *Obrist-Feldartzet*, and that to every 250 men was allotted a *Feldscheerer* with his *Knecht* or assistant.

In the Civil War in England in 1643 members of the Company of Barber Surgeons were attached to the six regiments of the Trained Bands of the City of London, commanded by Major General Skippen. After the first battle of Newbury they did excellent service, so much so that the Royalist journal, *Mercurius Aulicus*, makes special mention of them, saying that the Parliamentarians left behind them "very many chirurgions' chests full of medicaments."

Whether these surgeons penetrated as far as the fighting line; whether Thomas Morestede visited in his chariot—the prototype, I presume, of the modern brougham or perhaps of the omnibus which accompanies the French "Ambulance"—or

whether Mr. Physician Colnet was only to be consulted in his office at the historic windmill on the field of Agincourt, history telleth not; but in them and the barber surgeon we find the precursor of the modern regimental medical officer.

Assistance was also given in the early 15th century by women. In the old troubadour song, "Aucassin and Nicolette," Nicolette "inquired about his hurt, found his arm out of joint and put it in again." All women of gentle birth in the feudal days were instructed by their mothers in the preparation of medicines and the simple dressings of wounds, while love impelled them to follow husband and sweetheart to the wars. If Nicolette was able to reduce a dislocated arm I am afraid she imbibed more knowledge in her mother's bower than her present-day certificated sister does from first-aid lectures in the parish school room.

Not only did the ladies of the day help in the field, but they nursed the wounded who were collected into a special hospital tent.

However, *tempora mutantur et nos mutamur in illis*, as the old monastic Latin has it, and whether it was that the class of woman changed, or the contamination of camp life had its effect, we find in the 16th century that these first-aid sisters had been put in charge of an official called a Hurenwaibel (whore sergeant)—fairly conclusive evidence that they had changed the method of their philanthropy.

Nor was the provision of bearers altogether wanting in the armies of bygone days, for as early as the 6th century the Emperor Maurice ordered eight to ten stout fellows to be selected from each division of cavalry—200-400 men—whose duty it was to bring the severely wounded to the rear and to refresh them with water from their canteens.

It was not, however, till 1792 when Larrey took up the subject that any systematic method was thought of, by which the wounded could be attended to and quickly removed from the site of the contest. I will not linger over the changes which have taken place since then or enumerate the hopes, and the failures to settle the question, for they are all set down in Longmore and other similar treatises. Wars change in their character and the experience of yesterday is not always the lesson of to-day.

Though we can learn much from the past the future is to some extent a matter of speculation.

Let us pass at once to the present time, and inquire what we expect from the regimental stretcher bearer? This is the name by which the man who gives first aid in the fighting line is known in England: he corresponds to your "company bearer," but while he keeps with the battalion during an engagement he does not necessarily remain with his company. May I suggest that the term company bearer is too much like bearer company to be convenient?

Each infantry battalion consists of eight companies and is on service accompanied by a medical officer who has at his disposal

1 Non-commissioned officer.

1 Private as orderly.

16 Regimental stretcher bearers (two per company).

1 Mule and pair of field medical and surgical panniers.

1 Field companion and water bottle.

1 Surgical haversack.

1 Circular tent (surgery).

8 Stretchers (one per company), carried in the company carts. This double allowance enables the bearers to leave wounded at Collecting Station and return at once without waiting for the stretcher.

When an action is expected and the main body deploys into line of quarter columns, say at 3000 yards from the enemy or less if there is cover, the 16 stretcher bearers fall out, leave their rifles and packs in the company carts and take out the stretchers. They then form up under the regimental surgeon, who is accompanied by his orderly carrying the field companion, surgical haversack and water bottle,—no small burden for one man,—but the corporal with the mule and panniers remains near the reserves to be ready during and immediately after the action.\* The bearers wear a white band with S. B. in red upon it, on the left arm above the elbow; in the same way that your company bearers wear a red band and the French a cloth band with a white Maltese cross.

It will be noticed that the valises are placed in the company carts, not stacked on the ground near a wagon, as in the French

\* Med. Regulations § 697.

service—the latter plan readily leading to their loss. In the British service the rifle is also placed in the cart, but in the French and German it is retained and slung across the shoulder “*en baudontiere*.” As the regimental stretcher bearers are not covered by the Geneva Convention there is no reason why they should part with their rifles, but any one who has tried to lift a patient or carry a stretcher thus hampered will soon come to the conclusion that the bearers and their weapons are at those times best apart. This question suggests another, a little off the lines of subject, but of great importance to us, and one which might lead to a great deal of trouble—the retention of the arms of a wounded man. Regulations exist in most services that a wounded man's rifle and equipment should accompany him from the field through all the different lines of assistance even to the base hospital; a place is made for it in the ambulance wagon, and the pack storekeeper has it in fast keeping in hospital. A very nice and tidy arrangement certainly, but if you retain these firearms can you claim neutrality under the Convention of Geneva? At Froeschwiller a German staff officer threatened to shoot every one in the French “Ambulance,” established under Sarrazin in the town hall, if a rifle was found inside it. Sharp measures, but legally correct, and therefore the question deserves our consideration.

To return to regimental aid—it is the duty of the medical officer and his stretcher bearers to keep up with the fighting line, never losing touch of their corps, but keeping in close proximity to it; giving temporary assistance to all who are injured and attaching a tally \* to each describing the nature of his wound; but they will on no account attempt to carry back the wounded for long distances or in any case beyond or in the rear of the Collecting Stations formed by the bearer companies. The regimental bearers only are allowed to carry a man back or attend to a wounded companion, otherwise there might be straggling; and although we may instruct every man in the ranks in first aid, it must be thoroughly understood that it is with the object that he may be able to look after himself, if necessary, and that he has no roving commission in ambulance duties.

\* Med. Regulations § 699.

How will the new condition of things—increased range, smokeless powder, and magazine fire—affect the regimental aid? I am not one of those who believe that we shall have a very great increase of wounded to attend to, for I believe the man to be a much larger determining factor than the weapon. This question is too long to be discussed here, but as a personal opinion I believe Melville's estimate \* of a 10 per cent. loss is much more probable than Fischer's of 30 per cent.

The increased range of the modern rifle will compel us, in anything like open country, to place the Collecting Station 1000 to 1500 yards in rear of the fighting line—Fischer says 2000 metres—a distance impossible, as the experiments of Von Kreis have shown, for even stalwart bearers to accomplish with any appreciable number of wounded. Moreover it seems that the time occupied in long journeys might be better employed in attending to the wounded *in situ*. This does not mean that the regimental bearer will require no stretcher drill, but only that long journeys are impossible.

Now for the duties. In the earlier stages of the fight, during the artillery duel at a range of 3500–2500 yards casualties will be few and principally among the gunners and their infantry escort and can be easily attended and removed to a place of safety. As the infantry advance to the attack they will come under fire as soon as visible at a range of, say, 1700 yards and the casualties few at first and till 800 yards is reached, will gradually increase from that distance to the decisive range of 500 yards where the firing is point blank. Over this ground 1700–500 yards which Surgeon Captain Melville † calls the "chance zone," the number of killed and wounded will depend on the celerity with which the men are brought across it. At first the wounded can be treated and transported to the rear, perhaps handed over to the bearer company; but as the decisive range is approached they must be collected in groups behind any natural cover the ground may afford. It is at the decisive range that the regimental bearer will find the necessity for all his courage, all his presence of mind, and all his discipline. With the dead and dying lying in whole ranks as the

\* *Journal of United Service Institution of India*, July, 1896.

† *Ibid.*, December, 1894.

## STOPPING BLEEDING IN A WOUND OF THE ARM.

SELF-HELP FOR  
THE

WOUNDED,  
From the German of  
Dr. L. DIEMER,  
Stabsarzt in Dresden.  
Translated by  
Surgeon, Capt. Fletcher.

## PLATE I.

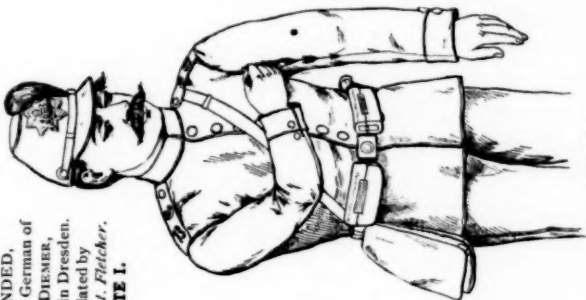


FIGURE 2.



FIGURE 1.

Before the beginning of the action, knot the handkerchief, which is folded as a narrow bandage, by the two corners. Draw the knot quite tight and carry the sling thus formed inside the tunic in front where it can most easily and quickly be reached by either hand.

In the case of a wound in the arm, lay it bare by cutting up the seam, place the point of the knife in the seam as depicted in figure 2, and cut in the direction of the arrow. Then take note of the description of the bleeding.

If this is little or none or only in single drops repair to the dressing station. See plate iv. 1, 2 and 3. If bleeding is moderate, take the handkerchief at once, if bleeding is severe, take at once the knotted handkerchief and put it over the wounded arm in its fleshy part and at least a handbreadth above the wound—not near the wrist or the elbow. Then put into the loop of the handkerchief a piece of wood (a bayonet, knife, revolver, or anything of that kind handy and twist it tight, then continue to turn the wood round, never leaving the handkerchief as depicted in figure 3. The wound itself is not to be dressed. If the bleeding stops repair at once to the dressing station, holding the tourniquet firmly and get the wound dressed as soon as possible.



FIGURE 3.

FIG. 1. DR. DIEMER'S FIRST PLATE.

Germans did around St. Privat,\* with no curtain of smoke, but only the ceaseless hum of magazine fire in his ears, will the bearer have to flit from post to post tending the wounded and alleviating the dying. There will be no question of carrying men to the rear for neither bearers, nor wounded, would live through it. The Balmacedists who were under magazine fire in the Chilian War declared they would sooner be shot outright at the beginning of a fight than undergo the mental torture of that leaden hail again. That the proportion of dead to wounded will be increased seems generally admitted and the proportion estimated at 1 to 3. This will to some extent lighten the bearers' work. The report of Colonel Rivera that in the Chilian War the proportion of dead to wounded was 4 to 1 is, I am told, accounted for by the fact that nearly all the fighting was behind earthworks and the wounds mostly in the head.

We must remember that although the troops are extended earlier than heretofore, and so the area of casualties increased in the first stages of the attack, yet this is the most favorable period for the removal of wounded. A brigade assaulting alone will not have a frontage of more than one-third of a mile, say 600 yards, and consequently an individual battalion will not have a frontage in the first line of more than 300 yards. Should the brigade be part of a division the extent of front will, of course, be still less.

The last stages of the fight, then, will be the trying time. Over a frontage of 300 yards the surgeon with his orderly and 16 men, or what is left of them, will have to tend the injured. There will be no command "search for wounded," for at that period wounds will be served out as fast or faster than they can be dressed, and the battalion may consider itself lucky if its surgeon is not one of the first to fall. The late Japanese war statistics disclose the ominous fact that 4 per cent. of the total casualties were medical officers. A medical officer is an expensive article to train and not easily replaced at a moment's notice. Old Homer says

A wise physician skilled our wounds to heal,  
Is more than armies to the commonweal,

---

\*The Germans are said to have lost 5000 men in 15 minutes, and that in 8 hours 21,000 Germans, and 12,273 French were *hors de combat*.

SELF-HELP FOR  
THE  
WOUNDED,

From the German of  
DR. L. DIEMER,  
Stabsarzt in Dresden.  
Translated by  
Surg. Capt. Fletcher.

PLATE II.

STOPPING BLEEDING IN A WOUND OF THE THIGH.

*General Rule.*—Practice the necessary movements in time of peace, so that in case of real necessity you can perform them with as much ease as the manual exercises. In this way alone will you be able to do so satisfactorily and with a rapidity sufficient, it may be to save your life, at all events, to ease your condition.

1. Expose the wound by cutting through the clothes and turning them back. If the bleeding is profuse—in streams or spurting—a handkerchief folded lengthways (a haversack strap braces, water bottle or valise strap, a bridle or anything of that sort handy) must be bound round the thigh or valise breadth above the wound and so knotted that there is room to put the fist between it and the thigh. You then use as a lever a piece of wood, bayonet, knife, &c., and as in the arm twist it gradually until bleeding stops. [The best thing for binding round a leg is an elastic India-rubber belt, as so often worn round the waist—it is more easily obtainable than the articles mentioned above.]

In case of bleeding remember that every moment is precious and must be made use of. After the blood has stopped the wound must not be touched but left unbandaged for the present. As a rule this can safely wait until arrival at the dressing station.

The tourniquet must not remain on more than three hours and therefore medical help must be sent for as soon as possible. You must act as shown in Plate III.



FIG. 2. DR. DIEMER'S SECOND PLATE.

—a sentiment in which a tactician would not agree, though he might admit that the records of late wars disclose an enormous butcher's bill of what he generally calls non-combatants. The Japanese follow the English in putting medical officers in the actual fighting line and the reason is the great moral effect it has in promoting confidence in the troops.

Besides the duties mentioned, the regimental bearers should have some knowledge of bearer company work, for the latter unit has but a limited mobility, and is not always able to keep continuous touch with its brigade. So also as is laid down in "Staff Duties in the Field,"\* a dressing station once established can hardly be moved during the same day. In the case then of a rapid forward movement a great deal of the bearer company work may fall on the shoulders of the regimental aid.

Let us pass to the technical instruction of the regimental bearers. What are the nature of the injuries they will be called upon to treat? Wounds, fractures and especially hæmorrhage, and to the rapid treatment of these emergencies must we train them. It is generally admitted that the large increase in the proportion of dead will be due to hæmorrhage. Dr. Herman Fischer of the German army considers there is another factor, viz.: greater liability to wounds of the upper extremity, but Melville has shown that the statistics of modern wars do not support this opinion. The immediate treatment of hæmorrhage, therefore, is the most important point in the instruction of regimental bearers and indeed of all military first aid. The first officer killed in the Egyptian campaign of 1882 was shot about two inches below the groin and in two minutes he had bled to death because there was no one near who understood what to do.

The Regulations for the instruction of regimental bearers in the British service† is as follows: In every unit four men, at least, per squadron and two per company will be trained as stretcher bearers of the corps, according to the instruction in ambulance and stretcher drill and in rendering first aid to the wounded laid down in the Manual for the Medical Staff Corps. The training of officers and men, whether of the Regular forces,

\* Grierson's translation of Von Widdern's "*Das XVI Armee Corps, etc.*"

† Queen's Regulations, Sec. XIV—§§ 58-66.

or of the Militia, Yeomanry or Volunteers, in these subjects will be carried out by medical officers under the orders of general officers commanding and principal medical officers of districts.

Commanding officers of units will afford medical officers undertaking the duty every facility for the formation and instruction of classes and will detail a competent non-commissioned officer to assist the medical officer in the drill and take charge of the equipment and appliances used in the instruction.

On the formation of a class, whether in connection with one or more units, officers and men of any branch of the service will be allowed to attend.

The class will consist of at least 12 lectures and 12 drills, of which attendances at nine of each must be certified by the instructing officer before application is made for examination as to proficiency. A class should consist of not less than eight persons.

When a class has completed its course and is ready for inspection, the instructor will submit the names or the inspection report of the ambulance class (Army Form I, 1224), for transmission through the commanding officer to the general officer commanding, who will send it to the principal medical officer of the district: the latter will forward it, together with authority to inspect the class, to the medical officer he may detail as examiner, who will examine the class and complete the form.

Any number of officers and men may qualify and their names be recorded in the Inspection Report I, 1224. Certificates of proficiency (Army Form E, 596) will not be granted to the Regular forces, but only to the Militia and Volunteers.

Regimental stretcher bearers when parading as such will



FIG 3. REGIMENTAL STRETCHER BEARER'S BADGE IN THE VOLUNTEER FORCE.

The outer circle is the cloth of the tunic, upon which the badge is worked. The centre is white, the letter "S" is red and the letter "B" is blue, while the inner circle is of a red slightly different from that of the scarlet tunic. The Volunteer Medical Staff Corps wear the Geneva Cross instead of the Monogram.

wear an armlet of special pattern—a white web band with the letters S. B. in red upon it. This is common to all portions of the force, Regular, Militia or Volunteer. In addition non-commissioned officers and men of the Volunteers in possession of the ambulance proficiency certificate, E, 596, will, as long as they maintain their efficiency, wear a badge consisting of the letters S. B. in a monogram, in red and blue, upon a white ground enclosed within a red circle  $1\frac{1}{2}$  inches external diameter. It is worn permanently sewn on the right arm above the elbow.\*

To insure efficiency, all trained regimental stretcher bearers are required to attend at least four stretcher drills annually.

The principal medical officer of a district will draw and hold at headquarters a limited supply of stretchers and appliances for instructional purposes and these will be loaned to units holding these classes, on the application of the commanding officer, who will be responsible for their custody and return.

It is also laid down that when troops are exercised during manœuvres, bearer companies, field hospitals and stretcher bearers of corps will be organized and exercised as laid down in the Regulations for medical services of an army in the field.

To carry out these orders, in the Regular forces the principal medical officer of the district, as soon as he receives information a class is to be formed, details a medical officer in his command to act as instructor. In some cases the M. O. in charge of the barracks teaches the class, but it is generally made up from different units and held at the station hospital where the material is stored.

In the Militia,† one non-commissioned officer and ten men are detailed from each battalion to be instructed in Medical Staff Corps duties during the training. They must be of good character and fair education and should volunteer for the work. They are trained as hospital attendants, in stretcher drill, and other duties pertaining to the M. S. C., under the orders of the P. M. O. of the district in which their battalion is out for training, and for this purpose they are attached to a unit of the M. S. C. in a military hospital. The non-commissioned officer

\* Vol. Reg. § 875.

† Militia Regul. §§ 251-253.

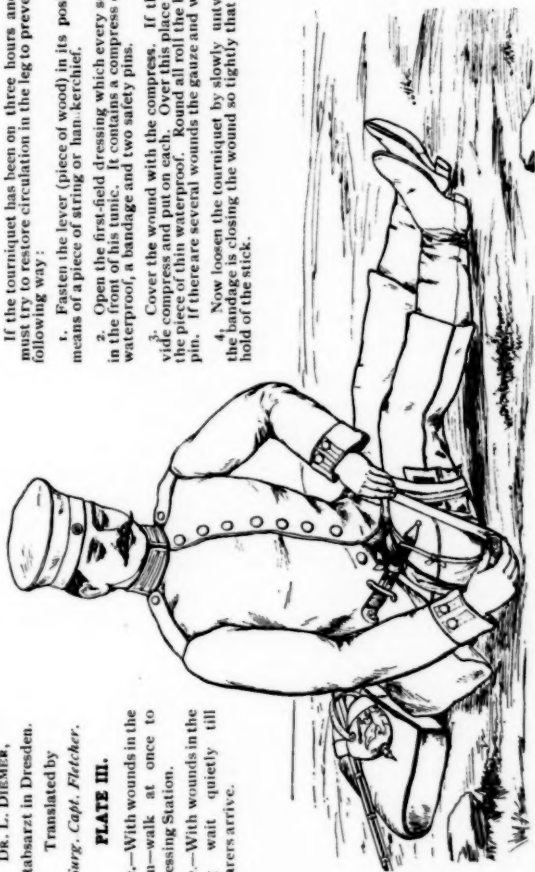
SELF-HELP FOR  
THE  
WOUNDED,

From the German of  
DR. L. DIEMER,  
Stabsarzt in Dresden.  
Translated by  
Surg. Capt. Fletcher.

PLATE III.

*a.*—With wounds in the  
arm—walk at once to  
Dressing Station.

*b.*—With wounds in the  
leg wait quietly till  
bearers arrive.



PROCEDURE AFTER STOPPING BLEEDING BY A TOURNIQUET.

If the tourniquet has been on three hours and there is no bearer at hand, you must try to restore circulation in the leg to prevent mortification. Do this in the following way:

1. Fasten the lever (piece of wood) in its position by securing one end of it by means of a piece of string or han-ketchief.
2. Open the first-aid dressing which every soldier carries in the special pocket in the front of his tunic. It contains a compress of charpie, gauze, a piece of thin waterproof, a bandage and two safety pins.
3. Cover the wound with the compress. If there are several small wounds divide compress and put on each. Over this place the gauze and above this in turn the piece of thin waterproof. Roll all the edges of the waterproof together to form a pin. If there are several wounds the gauze and waterproof must be divided.
4. Now loosen the tourniquet by slowly untwisting the stick and see whether the bandage is closing the wound so tightly that no blood escapes. You must keep hold of the stick.

5. If there is a great deal of bleeding through the bandage you must tighten up the tourniquet again or you will bleed to death.

6. Supporting a wounded part sometimes suffices to stop slight bleeding, it prevents recurrence and diminishes pain.



FIG. 4. DR. DIEMER'S THIRD PLATE.

has to attend a course of training, not exceeding two months, at the depot and training school of the M. S. C. at Aldershot and it should immediately precede the training of his battalion. These men belong to the Militia Reserve and are drawn upon to make up the complement of bearers in the Regular bearer companies when they are mobilized for war. Officers commanding battalions are instructed to exercise judgment in selecting men in view of their duties.

In the Volunteer force\* to which I have the honor to belong we have no difficulty in obtaining a good supply of regimental bearers or in undertaking their instruction. The supply of medical officers is liberal. Each battalion of eight companies is allowed three, one of twelve companies four. These medical officers are in civil practice but are bound to pass, within a limited time after commission, an examination before a medical board convened by the P. M. O. of the district. The examination includes squad, company and bearer company drill; the organization of field hospitals and bearer companies; first aid to the wounded, the diseases incidental to military life, a knowledge of the Army Medical Regulations and the sanitary and other duties generally of a medical officer in camp and on the line of march.

To these medical officers is left the organization of first aid in their regiments. Sometimes a brigade class is formed at the headquarters of one of the regiments and instructed by one or more of the regimental surgeons under the direction of the brigade surgeon; but most frequently the regimental M. O. is left to train his own men in the way he thinks best. Personally I much prefer a regimental to a brigade class and am persuaded the instruction is better assimilated and certainly the personal supervision, which is all important, is difficult with the larger number.

Having decided to hold a class for the first aid certificate the fact is announced in the monthly battalion orders, and details given of days, dates, and places when they will take place. To these lectures both those who are already trained as well as those wanting the certificate are admitted. There is a stretcher drill every Monday night during the greater part of the year which the ambulance recruits can attend for their twelve qualifying drills.

\* Vol. Reg. § 91.

## METHODS OF GETTING TO THE DRESSING STATION.

SELF-HELP FOR  
THE  
WOUNDED,  
From the German of  
DR. L. DIEMER,  
Stabsarzt in Dresden.  
Translated by  
Surg. Capt. Fletcher.  
**PLATE IV.**

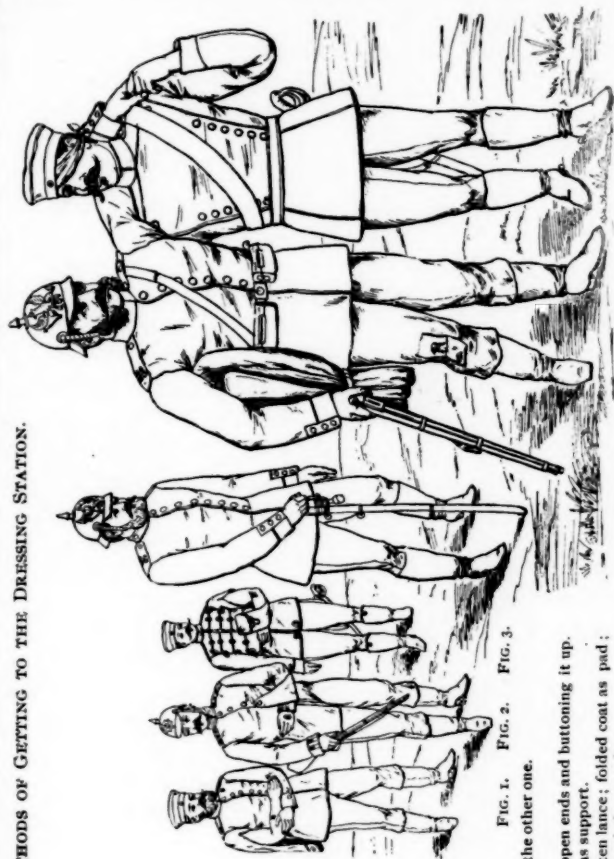


FIG. 1. FIG. 2. FIG. 3.

FIG. 1. Supporting wounded arm by the other one.

FIG. 2. By front of tunic.

FIG. 3. By sleeve cut open. Slitting open ends and buttoning it up.

FIG. 4. Wounds of leg, using sword as support.

FIG. 5. Making crutch of gun or broken lance; folded coat as pad; supported by another slightly wounded comrade.

FIG. 4. FIG. 5.

FIG. 5. DR. DIEMER'S FOURTH PLATE.

The subjects to be taught are those laid down in the Manual for the Medical Staff Corps and comprise

Anatomical and Physiological Outlines.

Bandages and Bandaging—triangular.

Fractures and the apparatus for their treatment.

Dislocations and Sprains.

Wounds: Dressings and their application.

Cases of Emergency and their immediate treatment.

Bleeding, burns, dislocations, drowning, fits, poisoning, shock, sprains.

The various methods of lifting and carrying wounded.

To start with it must be noted that the men to be instructed do not bring trained minds which easily grasp these highly technical subjects. In my own case the men all belong to the artisan class and however eager they may be to learn, it is absolutely necessary to present the subject to them in a simple and intelligible form,—stripping it as much as possible of technicality and giving to them only the essentials. An elementary knowledge of anatomy and physiology must be insisted on that they may appreciate the teaching of first aid; but give no more than is sufficient to explain the work they will be called upon to do—train not for an examination but for the treatment of emergencies. The instruction must appeal to the eye as much as possible both by diagram and demonstration and any apparatus likely to be used must be produced and explained. My friend, Surgeon Captain F. J. Warwick, of the East London Volunteer Infantry Brigade Bearer Company, is now producing some lantern slides for first aid lectures, which should be very valuable adjuncts to the instructor.

The plan I adopt is to give to each man a syllabus of the lecture, not only that he may follow it more readily, but may refresh his memory afterwards by looking it over. They are not encouraged to take notes during the lecture, but are provided with note-books in which they can, when they get home, and with the aid of the syllabus, write out shortly what they remember of it. This plan is found to give good results; and to stimulate their energy, a small prize is offered, generally some first-aid hand-book, for the best notes of the course. On one occasion very elaborate notes were received from one of the class,

SELF-HELP FOR  
THE

WOUNDED,

From the German of  
Dr. L. DIEMER,  
Stabsarzt in Dresden,

Translated by  
Surg. Capt. Fletcher.

PLATE V.

METHOD OF LOCOMOTION OF A MAN

UNABLE TO WALK.



The wounded man unable to walk can move himself in a sitting position in the direction of the arrow. This may be necessary to reach a place where he may be sheltered from the enemy's fire, protected from being ridden or driven over—tree, house, wall or ditch—to reach drinking water, to get nearer to the dressing station, out the woods, or to a place where he may be more easily found by the stretcher bearers.

With his hands stretched behind him he supports his body in a sitting position. Bending the unwounded leg as much as possible and raising himself slightly from the ground he pushes himself backward by stretching this leg and dragging the wounded one after him. He continues this movement until he reaches a place of safety.

FIG. 6. DR. DIEMER'S FIFTH PLATE.

not, however, of the lectures, but extracted from some text-book—a contingency not expected.

The Manual for the Medical Staff Corps is the official text-book and forms the basis of the instruction, each syllabus showing the sections in the Manual dealing with the subject. It contains, however, other subjects than those required by the regimental bearer, is not found a very satisfactory book to assimilate, is of an inconvenient size, and costs one shilling and sixpence. To each recruit, therefore, is given instead of it, Gell's "Aid to the Sick and Wounded," price 2d., and Hull's "Stretcher Drill" (an excerpt from the Manual), price 3d. These books are of a convenient size and Gell is a marvel of conciseness and clearness. The ideal book for this work is the *Album für Krankenträger*, by Dr. Ruhlemann; fully illustrated, a handy size for the pocket, and costing only a shilling, it is a pity we have not yet had an English translation of it.

Surgeon Captain F. J. Warwick and Surgeon Lieutenant A. C. Tunstall, both of the E. London Brigade Bearer Company, are now drawing up a series of illustrated summaries which are far in advance of anything I have seen—there will be fourteen in all.

It has already been stated that the language of the instruction should be as plain as possible, but it must be remembered also that the class of men dealt with dearly love a long word and will attempt the pronunciation of any technical one they find in their text-books. It is as well, therefore, to write on the blackboard any such word they are likely to come across and teach them its pronunciation. This will save us from being told that a man was suffering from a "bleeding artillery" or that another died of "sign-cop."

Passing to the lectures themselves, they commence with some introductory remarks on the scope of the work to be done, the number of drills and lectures to be attended, and the absolute necessity for understanding the working of the human machine before you attempt to patch it up. The bearers are also given some idea of the actual circumstances under which they will have to give aid on service and that to do so effectually they require knowledge, discipline and self-reliance. The remainder of the first lecture is given up to a description of the

### IMPORTANT GENERAL RULES FOR THE TREATMENT OF WOUNDED.

1. Never touch a wound with anything unclean—dirty fingers, non-disinfected bandages, dirty water, &c.; it may cause inflammation, ulceration or blood poisoning.
2. Expose the wound by removing the covering article of dress, which contains many impurities. Unbutton or cut clothes and examine extent of bleeding.
3. If the wound does not bleed at all or only a few drops at a time, no immediate bandaging is necessary—leave this to beater.
4. If the blood is spurting or in a strong stream from a wound in the leg you must bind a tourniquet round a fleshy part, not a joint and at least a handsbreadth above the wound to stop the bleeding. See Plates I, II, and III. In this case also wound need not at once be bandaged.
5. Whoever is able to walk after being wounded must repair at once to the dressing station. See Plate IV. Those who cannot walk must be carried by stretcher bearers and must await their arrival by lying down in the manner presented—as quietly and comfortably as possible in order to avoid pain, bleeding and aggravation of the wound.



### SELF-HELP FOR THE

### WOUNDED,

From the German of  
DR. L. DIEMER,  
Subsarzt in Dresden.  
Translated by  
Surg. Capt. Fletcher.

### PLATE VI.

### HOW A MAN UNABLE TO WALK SHOULD LIE DOWN.

Open all articles of clothing which might hinder circulation of blood or breathing (coat-collar, necktie, belt). If wound is in the leg, place it comfortably and bind it to the other leg with a belt (reins, pocket handkerchief, &c.); the feet may be kept together by placing forage cap or haversack over toes. To avoid pain and bleeding raise legs by putting under them a valise, saddle, truss of straw, &c.—slight bleeding will often cease in this position of its own accord, without any bandaging. If a bandage is advisable to protect the wound from dirt, insects, flies or cold, use the little pocket dressing as described in Plate III. The cloak or valise may be used as a pillow.

FIG. 7. DR. DIEMER'S SIXTH PLATE.

general construction of the human body and the relation of the most important organs to the surface. This latter is most important, and beside being shown by means of a diagram exposing those organs, the instructor marks them out in chalk on the living body. A large diagram of Figure 100 in Captain Pilcher's book\* showing the relation of the organs of the chest and abdomen to the clothing would be most useful. There is a great want of a really good set of anatomical diagrams, the ones in use in my class are those of Fielder and Hoclemann (published by Allman), and are as good as any I know. Diagram 1 is 50×36 inches and the five others 36×26.

The second lecture and every succeeding one commences with a catechism on the work done the time before. The subject of this lecture is "Bones, Joints and Muscles." The bones are actually given into the men's hands that they may become familiar with them, and they are asked to put them in their proper place in the skeleton. As soon as the lower extremity is reached, the description of a joint is interpolated to show how it is connected with the trunk and each particular joint is described in its place. When we arrive at the ankle joint the men are told its great liability to sprains and that class of injury and its treatment brought to their notice. So likewise dislocations and their treatment crop up with the shoulder joint. This plan makes a break in the dull enumeration of the names of the bones and excites the bearer's interest. The ordinary name of each bone is given and its technical name written very legibly on the blackboard. The lecture concludes with a short account of muscle tissue and by some homely examples its contractility and influence on fractures is demonstrated.

The third, fourth and fifth lectures are devoted to "Fractures and Bandaging." After an explanation of terms the varieties of fracture are demonstrated on a piece of wood and by attaching bits of elastic the distortion by muscular action is easily shown. The mending of a broken bone is explained by a little glue and a splice of putty. Then follows a description of the signs of fracture, its immediate treatment and the methods of improvising splints. No special splints are used, beyond

\* First Aid in Illness and Injury. By Captain James E. Pilcher, U. S. A. London: Kegan Paul, Trench, Trubner & Co., Ltd.

the wire arm splints in the surgical haversack, all others being improvised from some article of clothing or equipment. It is most necessary to impress upon bearers that they do not "set" fractures, but only reduce the deformity as much as possible and immobilize the limb. So too many text-books on first aid give instructions for the reduction of dislocations, a most dangerous proceeding in such hands and not allowed in the British service; the medical officer alone should attempt reduction, the bearer immobilize only. All the work on fractures should be absolutely practical, the putting up of each given separately and copied by the men. Two diagrams of fractures by F. E. Brom-

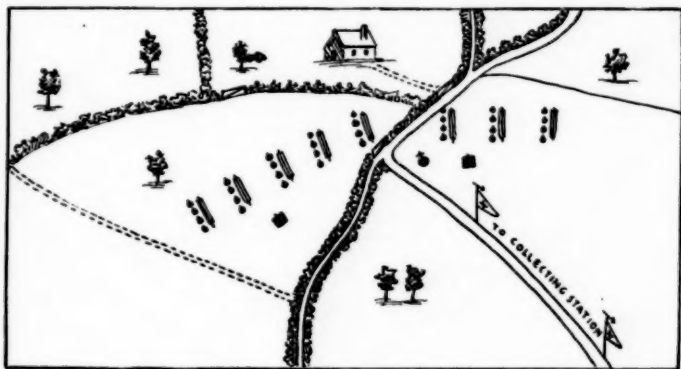


FIG. 8. THE BEARER COMPANY IN ACTION—THE STRETCHER SECTIONS WITH FIGHTING LINE.

*Personnel*—1 Surgeon Captain, 2 Sergeants, 32 Bearers.—35.

*Equipment and Transport*—8 Stretchers, 8 Surgical Haversacks, 8 Water Bottles.

ley may be used as adjuncts, but not to replace the practical demonstration. The use of the rifle splint in broken thigh requires careful attention to detail, and is perhaps the most important as it is the most complicated of any. The one point men are apt to forget, when putting up a suppositional fracture on a human being, is that having reduced the deformity it is necessary to keep up extension till the splints are fixed: they are very apt to put down the leg in the middle of it to reach a splint. To correct this tendency the dummy wooden fracture with elastic muscles will show the man at once the mistake he has made, and serves as a good object lesson that he

will probably remember. The majority of the bandaging is learnt in the two lessons on fractures and the bearer becomes acquainted with the contents of the surgical haversack at the same time, but the fifth lecture is devoted to a systematic study of the triangular bandage. The best way to teach it is the regulation method in two ranks, the front rank applying a bandage to rear rank and *vice versa*. Nowhere will you find a triangular bandage more neatly put on than by a soldier when he has been taught the way; tidiness is ingrained in his very soul.

The sixth lecture treats of the Organs of Respiration and the Purification of the Blood; the treatment of the apparently

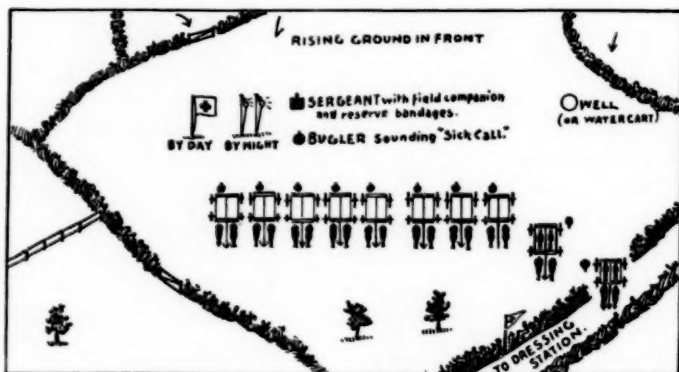


FIG. 9. THE BEARER COMPANY IN ACTION—THE COLLECTING STATION.  
*Personnel*—At Station, 1 Sergeant, 1 Bugler; on Wagons, 5 Corporals, 5 Privates.—12.  
*Equipment and Transport*—1 Field Companion, 1 Water Bottle, Reserve Bandages, 10 Ambulance Wagons.

drowned and a very slight sketch of the organs of digestion, the kidneys, skin and nervous system.

The seventh lecture comprises the Organs of Circulation and the Circulation of the Blood. This is illustrated by diagrams and a dead sheep's heart. A suggestion has been made, I think by Captain Pilcher in his paper read before your Association in 1896 and published also in the JOURNAL OF THE MILITARY SERVICE INSTITUTION, that the circulation should be shown in a chloroformed cat. This is, of course, the ideal method, but impossible in England, where vivisection certificates are only allowed to a few persons engaged in research, and never for purposes of

demonstration. The nearest practical method to show the changes taking place in the blood during circulation I have been able to devise is a primitive apparatus consisting of two Higginson's syringes marked across their middle into auricle and ventricle, two basins, one marked "lungs" and the other "capillaries" and a solution of litmus. Red litmus from the "lungs" basin is made to enter Higginson No. 1 (left side of heart) and is pumped thence into main artery (Higginson tube) and the "capillaries" basin; a little alkali added shows the

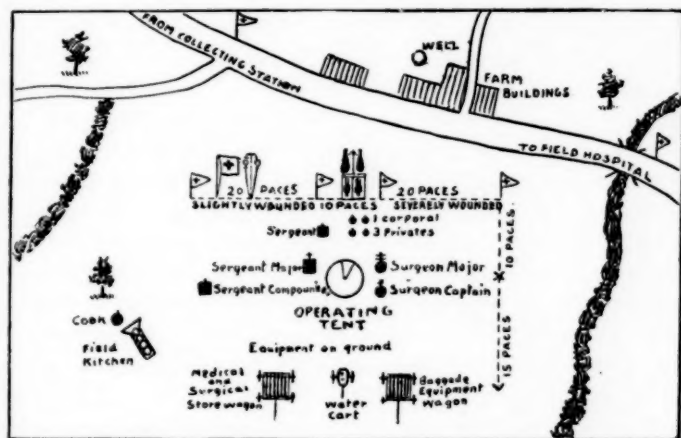


FIG. 10. THE BEARER COMPANY IN ACTION—THE DRESSING STATION.

*Personnel*—1 Surgeon Major, 1 Surgeon Captain, 1 Sergeant Major, 1 Sergeant (Compounder), 1 Sergeant, 1 Corporal, 1 Cook, 3 Privates.—10.

*Equipment and Transport*—1 Medical and Surgical Store Wagon, containing 1 Pair Equipped Panniers and 2 Field Fracture Boxes; 1 Baggage Equipment Wagon, 1 Water Cart.\*

change in the capillaries to blue venous blood; thence in second Higginson (R. side of heart) back to "lungs" basin, where a little acid changes it to arterial red and finishes the circle. It is a rough and ready method, but the men seem to grasp the idea.

The eighth lecture on Hæmorrhage is perhaps the most important of any. First there is a demonstration of the three kinds of bleeding—arterial shown by a Higginson, venous

\* In addition to the personnel and equipment enumerated in connection with Figs. 8, 9 and 10, we have in camp, 1 Q. M. Sergeant, 2 Cooks, 3 Batmen and 1 Supernumerary—7; 1 A. S. C. details Wagon and 2 Forage Carts.

through an ordinary piece of tubing and capillary by a soaked piece of sponge under an artificial wound. Following this the different methods of arresting hæmorrhage are explained; the construction and application of the tourniquets carried in the surgical haversack and how a tourniquet can be improvised. A point is made of finding out whether besides knowing, the men can impart their knowledge of this subject; a note is made of those who can for future reference when the instruction of the whole battalion in self-help has to be undertaken. Next the course of each of the principal arteries is marked in chalk on the human model and the treatment of hæmorrhage in the different localities explained. As each particular case is demonstrated the class perform it on one another; men here and there are asked what they are doing and not only why they are doing it but why some other plan was not adopted. In this way and with the general knowledge that an artery always takes the path of greatest safety from external violence the men very quickly pick up the course of a blood vessel, its name, the part against which pressure is made, and why in certain localities a tourniquet cannot be applied. It is as well to see that the men do actually stop the circulation when making digital pressure that they may understand the force really necessary. Each of the class is given a table with the syllabus showing the arteries, their course, the bone against which pressure is made, and the spots at which to apply it.

The ninth and tenth lectures are given up to Wounds and Dressings, and the utmost care taken that every individual in the class is thoroughly acquainted with every detail of this part of the subject. It may seem a waste of dressings, which naturally get dirtied, but every bearer is made to put a dressing on a wound and explain every part of it. Cleanliness is taught to be the eleventh commandment, and little as one likes filling up a regimental bearer with theoretical knowledge, the germ theory of wound pollution has to be imparted that he may understand the essence of antiseptics. On account of its utility in camp, where there may be a temporary hospital, the men are taught the use of wet dressings and lotions, but at the same time given to understand that in the field they will have to depend on dry dressings and never use the contents of the surgical haversack

as long as they can find a first field dressing on a wounded man. All bearers must know thoroughly this first field dressing and practice with it on every region of the body that they may accustom themselves to its uses, limitations, and rapid application. For this purpose a couple of these dressings are always kept in my surgical haversacks, although not part of their complement, that when an injury occurs at manœuvres the bearer may use it in preference to any other dressing. When the medical officer has his 18 men thoroughly familiar with it he has a very useful lever to assist him when he has to teach its use to the battalion.

The eleventh lecture is the bugbear of the instructor and the instructed and deals with Insensibility and Poisons. These subjects are part of the regulation course and therefore must be

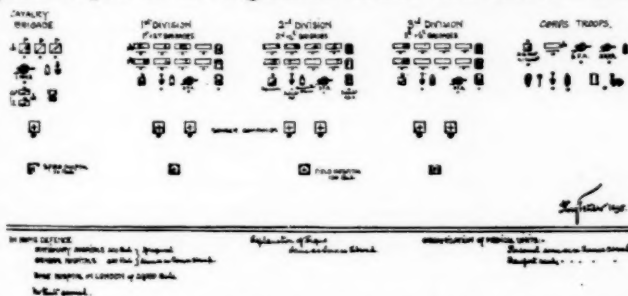


FIG. 3. DIAGRAM OF THE MEDICAL ARRANGEMENTS OF AN ENGLISH ARMY CORPS WITH CAVALRY BRIGADE.—HOME DEFENSE.

taught, but experience seems to show that though a man of the class we have to deal with may cram them for an examination, as a medical student does *materia medica*, a week or two suffices to "wipe his tables clean, and keep no telltale to his memory." That any bearer can be trusted to diagnose the different forms of insensibility I cannot imagine, and they are cases where a little knowledge is a dangerous thing. Shock, syncope and sun-stroke alone would I try to teach him and a drunken fit is not so great a rarity but what it may be recognized. The other forms of insensibility might well be left alone and why a regimental bearer should be asked to try and load himself with a knowledge of poisons and their antidotes is a mystery. He is not likely to see a case of poisoning once in a blue moon, and if he does will by that time have forgotten all about special

**PERSONNEL OF THE MEDICAL ARRANGEMENTS OF AN ENGLISH  
ARMY CORPS WITH CAVALRY DIVISION. (WAR FOOTING.)  
SERVICE ABROAD.**

**WITH ARMY CORPS STAFF:**

- 1 P. M. O.—Surgeon Major General.
- 1 Surgeon Colonel—Deputy P. M. O.
- 1 Surgeon Major—Secretary.
- 1 Surgeon Captain—Orderly Officer.

**WITH A DIVISIONAL STAFF:**

- 1 P. M. O.—Surgeon Colonel.
- 1 Surgeon Major in charge of staff.
- 1 Quartermaster.

**AT BASE:**

- 1 P. M. O.—Surgeon Colonel.
- 2 Surgeon Majors, 1 Embarking Officer.
- 2 Quartermasters, 1 in charge of Med. store.

**TOTAL OF MEDICAL OFFICERS AND MEDICAL  
STAFF CORPS WITH ARMY  
CORPS—[35,087 MEN].**

	M. O.	Q. M.	M. S. C.
With Army Corps Staff.....	4		11
3 Infantry Divisions.....	6	3	24
1 Regimental Units.....	41		
6 Bearer Companies.....	18		366
10 Field Hospitals.....	40	10	406
	122		801

**WITH CAVALRY DIVISION [6,700 MEN].**

Divisional Staff.....	2	1	10
Regimental Units.....	9		
2 Bearer Companies.....	6		122
3 Field Hospitals.....	12	3	120
	33		252

**ON LINE OF COMMUNICATION [11,959 MEN].**

H. Q. Staff.....	3		7
Staff at Base.....	3	2	17
Staff Advanced Depot.....	1		5
2 General Hospitals.....	36	2	240
2 Stationary Hospitals.....	18	2	150
With Regimental Units.....	5		
	72		439

**GRAND TOTAL:**

Army Corps.....	122	801
Cavalry Division.....	33	252
Line of Communication.....	72	439
	227	1492

400 Regimental Bearers }  
256 M. S. C. Bearers.... } 656

**WHEELED TRANSPORT WITH THE EIGHT  
BEARER COMPANIES.**

80 Ambulance Wagons or Accommodation for  
480 Men.

The 2 A. S. C. Co.'s at Base have 26 Ambulance  
Wagons.

The 2 A. S. C. Co.'s on Line of Communication  
have 26 Ambulance Wagons.

The 1 A. S. C. Co. at Advanced Depot has 13  
Ambulance Wagons.

There are 1320 hired wagons plying between  
Railroad and Advanced Depot, and returning  
empty.

13 Field Hospitals provide for.....1300 sick.  
Hospitals on Line of Comm'n'cation.....1200  
Total.....2500

**REGIMENTAL AID:**

- 1 Medical Officer—attached.
- 1 Corporal in charge of panniers } drawn  
1 Private as Orderly ..... } from the  
16 Privates as Bearers..... } Regiment.

**WITH BATTERY OR RE. UNIT.**

- 1 Medical Officer—attached.
- 1 Private as Orderly—from Unit.

**BEARER COMPANY:**

- 1 Surgeon Major..... } Army Med.  
2 Surgeon Capt. or Lieut..... } Staff.  
1 Surgeon Major..... }  
6 Staff Sergeants and Sergeants... } Medical  
6 Corporals..... } Staff  
1 Bugler..... } Corps.  
47 Privates..... }  
Total 64.

**FIELD HOSPITAL:**

- 2 Surgeon Major.
- 2 Surgeon Captain or Lieut.
- 1 Quartermaster.
- 1 Warrant Officer.
- 7 Staff Sergeants and Sergeants.
- Wardmaster 1.
- Compounders 2.
- Steward 1.
- Cook 1.
- Packstore Keeper 1.
- Supernumerary 1.
- 4 Corporals.
- Steward 1.
- Cook 1.
- Clerk 1.
- Supernumerary 1.
- 28 Privates.
- Ward Orderlies 14.
- Cook 1.
- Pack storekeeper 1.
- Messenger 1.
- Servants 5.
- Supernumerary 4.
- Washermen, 2.
- Total 45.

**STATIONARY HOSPITAL:**

- 1 Brigade Surgeon Lieut. Colonel.
- 2 Surgeon Lieut. Colonel.
- 2 Surgeon Major.
- 4 Surgeon Captain or Lieut.
- 1 Quartermaster.
- 1 Sergeant Major.
- 8 Staff Sergeants or Sergeants.
- 8 Corporals.
- 48 Privates.
- 10 Servants.
- Total 83.

**GENERAL HOSPITAL:**

- 1 Surgeon Colonel.
- 1 Surgeon Major (Secretary and Registrar).
- 2 Brigade Surgeon Lieut. Colonel.
- 2 Surgeon Lieut. Colonel.
- 4 Surgeon Majors.
- 8 Surgeon Captain or Lieut.
- 1 Quartermaster.
- Total M. O. 19.
- 3 Sergeants Major (1 as clerk).
- 11 Staff Sergeants or Sergeants.
- 1 Bugler.
- 10 Corporals.
- 76 Privates.
- 19 Batmen.
- 1 Interpreter (Civil).
- Total 121.
- Nursing Sisters Attached.
- Lady Superintendent 1.
- Nurses 7.
- Servants 2.
- Total 150.

antidotes, which is perhaps as well for the patient. The syllabus given the men for this lecture is much more extensive than most, giving exactly what the men must know. Poisons are divided into (1) narcotics, (2) corrosives, and irritants, (3) excitants,—a handy, though not scientific classification, I find easiest understood. The treatment of poisoning is stated in a simple and general form, requiring no great diagnostic skill and special antidotes omitted altogether. The actual summary of the lecture is all the bearer need know and he might as well learn it at home as attend a lecture on the subject.

The twelfth and last lecture treats of the Carriage of Wounded, and also contains a general sketch of the medical arrangements of an English army corps in the field. The latter part is no real portion of the regulation course, but is followed with very keen interest by the men and gives them the *raison d'être* of their existence. The regimental aid and that of the bearer company is considered in detail that the scope of each in manœuvre may be recognized. I have given before other reasons why the regimental bearers should have some knowledge of bearer company work. This lecture is illustrated by a number of diagrams and small copies of three of them are attached as they may be of interest to members of this Association, apart from the subject of first aid. I hope soon to have lantern slides of them all. Besides the diagrams bearer company work is easily shown by a small model. It is wonderful what a little paint and some linen will do to transform the carriages of the German small tin trains you buy in the toyshops, into ambulance wagons, and general service wagons. Take for instance the installation of a dressing station—a piece of painted cloth representing a road and adjacent country, some part the bearers know is best, and on this according to scale the dressing station is laid out in miniature with its directing flags, wagons, field kitchen, tent and equipment,—all marked out just as they may do it on the real piece of ground itself in a day or two under your direction. So too a dressing station installed in a house (after the model of the *Ambulance* in the French Regulations) may be conveniently shown with a box of children's bricks.

Such, gentlemen, is the scope of the class-room instruction and *pari passu* with it the stretcher drills take place.

At the conclusion an officer of the Army Medical Staff is detailed by the principal medical officer of the district to examine the class and certificates E. 596 are granted to those who pass.

These certificated first aid men, or part of them, become the regular regimental stretcher bearers. They make themselves

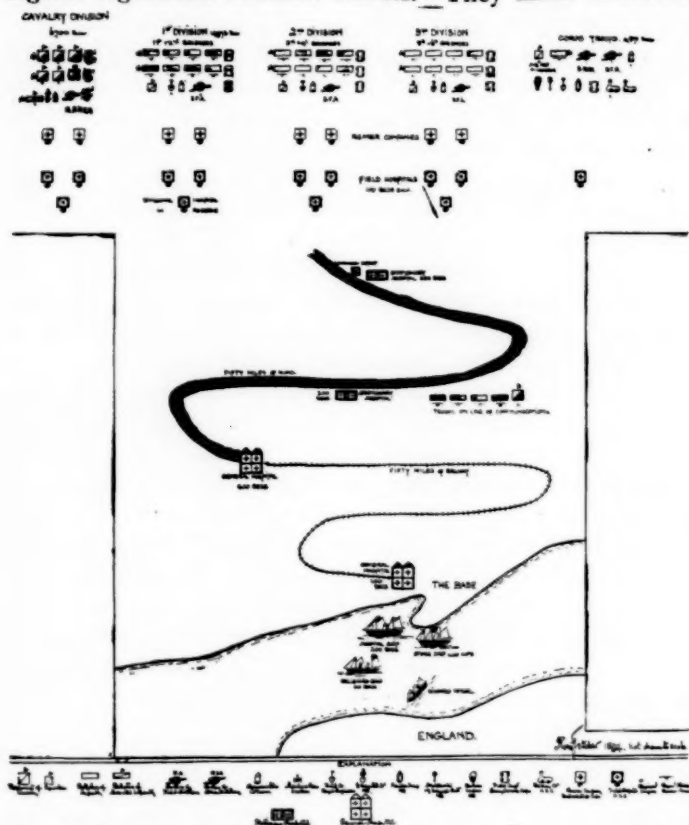


FIG. 12. DIAGRAM OF THE MEDICAL ARRANGEMENTS OF AN ENGLISH ARMY CORPS WITH CAVALRY DIVISION.—SERVICE ABROAD.

efficient as combatants every year both in drill and musketry. They attend special first aid lectures given by the medical officers for them as well as being present and helping at the recruits' course. They have a stretcher drill every Monday evening for six months in the year and though volunteers and

therefore only compelled to do a certain number, it is seldom there is less than twelve at these evening parades. The average stay of the bearers in the battalion is five or six years.

On route marches and manœuvres they are kept together : this insures knowledge of one another and uniformity in work ; the same men as far as possible always working in the same stretcher squad.

To make their knowledge thoroughly practical a certain number of casualty cards are given to captains of companies whenever the battalion is out for field manœuvres. These cards are distributed to men in the fighting line and the captain instructs them when to fall out as dummy wounded. The bearers are given the direction of a supposed Collecting Station, generally on a main road, and to this the "cases" are brought and the treatment examined and criticised. This work is not only interesting for the bearers but most useful and instructive and gives them an amount of confidence they would never otherwise obtain. This practical field work takes place about twelve or fourteen times a year.

In the Regular service the bearer company and field hospital are not peace units and until the last year or two were not mobilized for peace manœuvres. In the Volunteer force a permanent bearer company is being organized for each infantry brigade. Most of these are now formed and it is hoped that before long it will be possible, whenever the brigade is out, to practice the removal of casualties in the field in coöperation with the bearer company. This will be a great aid and a test to the efficiency of the medical service. Perhaps the day may come when the authorities will see the necessity for medical manœuvres on the scale of those held in France near Versailles in October, 1892, but I fear financial aid and other reasons are against it. If we wish to know why the Japanese medical arrangements in the late war were so efficient we have only to read Surgeon Major General Taylor's report \* and his description of the thoroughness of their peace rehearsals.

To stimulate the energies of the regimental bearers in my battalion, the medical officers hold a competition every October.

\* Report of the Medico-Military Arrangements of the Japanese Army in the Field, 1894-95.

It includes stretcher drill, anatomy and physiology, first aid and bandaging. A prize is given to each man of the best stretcher squad, another to the individual who obtains the highest aggregate of marks and one for the best recruit. The "best man" also has his name engraved on a silver challenge cup which has been given for that purpose.

In addition to these battalion prizes, the Volunteer Medical Association (the Association of the Medical Officers of Volun-



FIG. 13. THE AMBULANCE CHALLENGE SHIELD.

teers) instituted some years ago a handsome challenge shield (Fig. 13) of the value of 200 guineas to be competed for annually and open to squads of regimental stretcher bearers belonging to any Volunteer corps in the United Kingdom.\*

\* The following are the Regulations for the Ambulance Shield Competition :

1. The Challenge Shield, value 200 guineas, is offered for competition by the Volunteer Medical Association to encourage ambulance training in volunteer regiments, and will be held for the year by the winning regiment at each Annual Competition.
2. The competition for the Shield will take place annually in June, unless the Council otherwise determine.
3. The competition is open to stretcher detachments belonging to any regi-

There remains only one other phase of first aid to be considered—the general instruction of all ranks. While Germany and America have adopted this course England has not done so. Till 1894 the only persons trained in ambulance work (except, of course, the technical Medical Staff Corps, the Militia M. S. C. and the Volunteer M. S. C.) were the regimental bearers. In November, 1894, an order was issued that general officers commanding districts were to see that during the winter months all officers and men in their command received instruction in the use of the first field dressing. This is now done, and is perhaps as much as is required, if the information how to implement or corps in the Volunteer and Yeomanry forces and the Honorable Artillery Company; the Volunteer Medical Staff Corps excepted.

4. In regiments in which a definite number of bearers is allowed by regulation, each squad must be composed of certificated regimental bearers.

Non-commissioned officers above the rank of corporal are not eligible as bearers.

5. Local preliminary competitions may be arranged, if necessary, by the Council of the Association, in order to reduce the number of squads competing at the final competition to not more than twelve.

6. The judges at all the contests shall be selected by the Council of the Volunteer Medical Association.

7. *Preliminary Competition.*

Dress :—At preliminary competitions the detachments shall parade in drill order (all competitors must appear in the uniform of their regiment), with surgical haversack and stretcher of regulation pattern.

Drill :—As in final competition.

8. The words of command at preliminary competitions shall be given by one of the examining medical officers, or by a non-commissioned officer of the Regular or Volunteer Medical Staff Corps.

9. *Final Competition.*

Dress :—Review order, with leggings, if worn by the regiment. All competitors must appear in the uniform of their regiment.

Drill :—Stretcher and Wagon Drill.

Lifting and carrying wounded on stretcher and by improvised seats.

First aid and Bandaging (triangular bandage).

Stretchers will be provided, but each squad must supply its own haversacks, furnished with splints and bandages.

The general smartness and set-up of the men will be taken into consideration.

10. The words of command at the Final Competition will be given by an Instructor of the Medical Staff Corps, but in the case of a tie, No. 4 of each squad may be called upon to work his own squad.

11. Regiments intending to compete must inform the Hon. Sec., Volunteer Medical Association, 20 Hanover Square, W., before the 15th May, who, on receipt of Entrance Fee will send a card, which must be shown to the Examining Officer at all competitions.

provide a tourniquet is included. The diagrams of Dr. Diemer of the German army, shown in a greatly reduced form in Figs. 1, 2, 4, 5, 6 and 7, are most useful in this instruction and should be a permanent adornment of every barrack room. Dr. Diemer has kindly given me permission to publish them in English, which will be done shortly with all six diagrams on one sheet, the form found to be most convenient. I regret they are not yet published and that my own hand-drawn copy is not at the moment available; but I present for your notice copies of the original German diagrams and the translation I propose—it dif-

Entrance Fee, one guinea each squad.

Each man of the winning team to receive a badge.

*The following are additional regulations :*

Badges will also be given to members of the second and third teams respectively.

In all competitions (Preliminary and Final) the word of command shall not be given by any Sergeant-Major or Sergeant-Instructor who has been previously engaged in the drilling of any of the detachments competing.

At all preliminary competitions the Medical Officer of the competing regiment shall state, at the time of the competition, the names and ranks of the four members constituting the competing detachments; and at the Final Competition these four members *only* of the several detachments successful at the Preliminary Competition shall be allowed to take part in the Final Competition.

It shall, however, always be in the power of the Volunteer Medical Association to consider at any time, having previously received due notice through the Secretary, any circumstance connected with the unavoidable absence of any one or more members of the competing detachments, or in an event of an emergency, the same power shall be delegated to the representatives of the Association on the field at the Final Competition.

In consequence of the difficulty experienced in most districts in getting Ambulance Wagons for drill purposes, the Wagon Drill will be carried out with ordinary spring vans, such as can be obtained for practice by all competing teams.

This arrangement is in accordance with the principles laid down in the Manual for the Medical Staff Corps.

At all competitions each Stretcher Squad will parade with its own Haversack, furnished with splints and bandages.

*The Drill as laid down in the most recent MANUAL for the Medical Staff Corps will be adhered to in the Competitions.*

The marks will be apportioned as follows :

Drill.....	100 marks.
Bandaging. ....	100 "
First Aid.....	60 "
Anatomy.....	40 "
Total.....	300 marks.

fers a little from the German as the first field dressings are not the same in both countries.

Besides this lecture the battalion has one on boots, marching, food, etc., and the general care necessary to maintain health and remain effective in camp and on the march. This lecture is somewhat similar to the *Gesundheitspflege des Soldaten* of Staff Surgeon Lorenz, and I hope shortly to have on the same lines a small book for the pocket of the English soldier.

Gentlemen, the time between the arrival of your invitation and the date on which this paper must be mailed is short, and unfortunately during this time I had to be out with my regiment for training in brigade. Much of it, therefore, had to be composed in what spare time could be found between field days and other duties, and I would ask your kind indulgence for its many shortcomings. I do not flatter myself there is anything novel in this paper, still we can all work for that common cause—"our duty is to save." Some of us must beat the bushes, *Multi pertransibunt et angebitor scientia*. In our work the little that has been done seems nothing when we look forward and see how much we have yet to do.\*

In conclusion, gentlemen, let me once more thank you for your courtesy in inviting me to take part in your deliberations. Speaking the same language and our life blood drawn from the same source we have much in common and salute as cousins rather than strangers. The regiment to which my battalion is attached, the King's Royal Rifles, was originally raised in America in 1755 as the Royal American Regiment of Foot; but now, from that little island off the coast of France which Wendell Holmes has described as a freckle on the face of the globe and in the same breath "our little mother isle, God bless her," I send a hearty greeting to my *confrères* of the United States Army, and best wishes that they may have a successful meeting.

---

\* Goethe.

## THE LATE REVOLUTION IN COLOMBIA.

BY LIEUT. S. F. MASSEY, U. S. ARMY.

THE following sketch of some of the earlier events of the revolution that broke out in the "Republic of Colombia" in January, 1895, was written during an enforced stay of three months in that country at the time. Just why it was written is not now recalled, unless to help kill time; but, having run across the paper lately, it occurred to me that it might possess some interest to our military men as giving an account—a very imperfect one, it is true—of some of the exciting causes of that unsuccessful struggle; the manner of raising, organizing and equipping the insurgent forces; the treatment of prisoners by, and a little of the military operations of, the regular army. I determined to offer it to the JOURNAL whose readers are largely officers of the army and navy (many of the former and some of the latter my personal friends), trusting in a sufficiently indulgent audience to warrant its publication and remove what might otherwise—considering the superficiality of the treatment of the subject—have proven a "fatal defect." To help relieve the dryness of that treatment and, as it were, "adorn the tale," I have appended a few descriptions and incidents that would have been more pleasing, doubtless, if properly woven into the original sketch; but this would have required, that the product should be a finished magazine article, a much more serious undertaking than a simple story of passing events of a struggle, and impressions made at the time.

Lest my acquaintances might wonder how I became involved in these events I will explain that, at the end of six months (spent mainly in visiting different coffee regions) in Colombia, I found myself in Honda, a thrifty town at the head of the Lower Magdalena, where I was awaiting the arrival of certain correspondence from the States before taking steamer for the coast, and thence to Costa Rica.

### THE REVOLUTION IN COLOMBIA.

The Republic of Colombia is just now passing through another revolution. After an interval of ten years of peace and

comparative prosperity, the country began to realize last December that trouble was brewing. To the observing the only surprise was that the revolt against the government had been so long deferred, for it was notorious that a large majority of the people were seriously disaffected and only awaited a favorable opportunity to express their resentment in action.

The causes of the widespread hostility to the existing conservative government are readily understood by the most casual observer. They may be summed up in the statement that the country has become, under this régime, a military despotism. The president of the republic is, in fact, a dictator in time of revolution. Though not called so in words, still the constitution of 1886 and the laws, invest him with the unlimited powers of a dictator. Proclamation to that effect would be unnecessary. By "decrees" he makes known his will and the army stands ready to enforce it.

This is, perhaps, not strange since this people needs a strong hand at the helm at such times. Our own Civil War demonstrated the inherent weakness of a republic to wage war successfully in the earlier stages of the contest. If political interference at the beginning was a most serious drawback to military operations with us—the best representative of the republican form of government the world has seen—how much worse must such interference be in a South American republic, where the people are poorly qualified for self-government? Not till we learned that the war could not be carried on with success, unless the President and his subordinates in the field were given full control of the armies, did the Federal cause begin to prosper in the east. So discouraging had the situation become that many of our patriotic people believed that a dictator was necessary, and at least one commander of the Army of the Potomac (we now know from his own pen) was ready to assume that office. Fortunately, that most dangerous precedent was not established; but, remembering these facts, it is easy to understand that a weak South American republic would naturally invest all power in the head of the government when called upon to face a revolution backed by a large part of the people. Hence, we find a dictator provided for in the constitution of Colombia; a dictator in fact though not in name.

But the same constitution also vests, in effect, all authority in the central government,—in peace as well as war. True, there are apparent limitations prescribed. The right of life, liberty, and the pursuit of happiness is apparently recognized and safeguarded. Indeed, a careless reading of that instrument might lead to the belief that local self-government—that fundamental principle of a republic—was unalterably established in Colombia. But, on the contrary, all these fundamental principles, all these limitations are rendered worthless by the fact that all executive officers from the highest to the lowest, except the president and vice-president, are *appointed*. The elections, of which we occasionally read, are limited to the choice of these two officers. The president appoints not only the subordinate officers, high and low, of the general government, but the “governors” of the departments. These governors appoint the prefects of provinces,—heads of the next smaller divisions. The prefects appoint the “alcaldes” (mayors) of towns and villages, while the latter appoint the police.

Not only this, but all through the constitution occur brief clauses prescribing exceptions to the preceding limitations of power of the executive and his ministers, which exceptions leave the whole thing virtually to the discretion or caprice of the government.

The Colombian congress meets every two years. It consists of a “Senate” and a “House of Representatives.” Its sessions are limited, by law, to a period of four months. During the intervening twenty months the law prescribes that the president may, by decrees, provide for the public defense and common welfare. The power thus delegated is most sweeping. The vagueness of the law permits almost any stretch of the principle of “decrees”; the subordinate officers of the government, departments, provinces, cities and towns naturally refrain from questioning the legality of the acts of their chiefs, a scratch of whose pen would relegate them to private life; while the army can be counted on to obey orders without asking any questions. It is thus seen that all executive officers of the country, high and low, except the president and vice-president, are vitally interested in upholding the government to whom alone they are accountable.

As to the redress open to the citizen who believes himself aggrieved, a very few words will suffice.

The judiciary of the country is wholly inadequate to the needs of the citizens. What courts there are would be well enough were it not for the fatal fact that, except of the supreme court, the judges are appointed by the president or governors, and require no confirmation, thus giving the government a powerful influence over all the lower courts.

The judges of the supreme court hold life offices and are confirmed by the senate. (They are the only appointees of whatever grade requiring confirmation.) It is a good court as at present constituted, I am told, but overwhelmed with business. All other judges are removable by the appointing, or higher, power. Hence, it is not too much to say that the citizen has no redress as against the general or department governments, through the courts.

With this enough has been said, it is believed, to show that the central government is all powerful. Another fact worthy of notice is that in this country of about four millions of people (the large majority, poor and ignorant) who are spread over an area of more than 500,000 square miles, a standing army of eight thousand men is confessedly maintained, while the general opinion of the observing is that it is twice that. With such a force and the lack of effective constitutional restraints, is it strange that the "Republic" of Colombia has become, in fact, a military despotism, in times of peace as well as in war? Is it surprising that the rights of the citizen have been invaded to an intolerable degree?

To detail all the principal causes of complaint against the present conservative government would require more paper, if not time, than I have at my disposal. It is not my purpose now to do more than to try to show by what is briefly stated above, that the people of Colombia are living under a despotic central government and then to write a little about the present war.

Soon after the adjournment of the congress (toward the end of November, 1894), many signs indicated that a storm of revolt was brewing. Rumors began to fly about. To the knowing they were full of meaning. Besides other disturbing causes, the

death only a few weeks previous, of Dr. Nunez, the president, made the probability of an uprising strong. That fact alone would naturally, with many of the disaffected, be decisive that the "time to strike" was at hand. Trade was quick to note the ominous signs, while the government itself showed anxiety. It began quietly and secretly to prepare for the emergency.

Dread and apprehension seized the people of the isolated towns of the interior. One day would bring vague reports of insurrectionary proceedings at some remote point, to be followed the next by equally vague accounts of government moves to checkmate. Thus, for several weeks, was the public kept feverish and excited. Business, traffic and travel began to fall off at all points and everybody seemed waiting to see where the storm would burst.

Overt acts began about the middle of January. The pack train carrying mail was seized by the rebels on the road between Honda and Bogotá. About the same time the telegraph lines were cut in all directions, by which single stroke—in the absence of rail and wagon roads—practically all communication between the capital, the departments and the coast was cut off, leaving the mischief makers full swing to set afloat rumors of uprisings and conflicts at various points, that could not be confirmed or denied authoritatively for days, and, in some cases, weeks.

With all to whom the wish was "father to the thought," these reports were readily believed and industriously disseminated with suitable embellishments. The cautious and timid citizen begins to prepare for the worst by laying in extra supplies of food, etc., while the *alcalde* of the town proceeds, in the absence of instructions from his superiors, to take such ultra-despotic measures for maintaining the government authority and his own safety as his zeal or fears dictate, putting the screws down on the community in a way that greatly adds to the general excitement and alarm.

Thus it is that, without having done anything insurrectionary or knowing anything definite as to what has happened, the towns of the interior suddenly awaken to the fact that the normal modicum of civil procedure has been supplanted by martial law. That they are in a state of siege, the duration and outcome of which they can only guess, though, from the uniform

experience in time of revolution in Latin America, they are warranted in entertaining gloomy forebodings.

Such was the state of affairs in the prosperous town of Honda in the latter days of January. Honda is a strategic point of great importance, as was shown in the last revolution in 1885. It lies at the head of navigation at the lower Magdalena River, the main, in fact the only, artery of trade and commerce to the capitol and the interior departments of the country. These "departments," by the way, were formerly called "states." The change was made when, in 1886, the name of the country was changed from "The United States of Colombia" to the "Republic of Colombia."

In 1885 there was no garrison in Honda. The revolutionists promptly seized the town, and at one stroke, paralyzed the government for many months. In military parlance, they captured the enemy's line of communications. Holding this point strongly, they seized a steamer lying at Yeguas—the port of Honda, sixteen miles north—and with her captured all the other steamers on the Magdalena River and all the towns to, and including, Barranquilla, at the mouth.

Honda is the great *entrepôt* of the country. It lies six hundred miles inland. From Honda radiate the roads—the trails they should be called—to the Departments of Antioquia to the northwest, Tolima and Cauca to the west and south, and Cundinamarca (with the capitol) to the east. Antioquia, however, has another road, from Puerto-Berrio on the river, lower down. Also, Cauca may be entered through Buenaventura on the Pacific Coast, the back door, as it were, to the country, little used by reason of its many difficulties.

From Honda there are two routes to Bogotá. The first by mule trail direct to Facatativá at the terminus of the short railroad out of the capitol. The second, by the upper Magdalena to Girardot, and thence overland to Facatativá. Thus the party holding Honda has the capital by the throat, so to speak.

Learning this fact from costly experience in 1885, the government, after suppressing the rebellion, placed a permanent garrison in Honda of about two hundred regular soldiers. That number ought to be able to hold the town against five hundred well equipped antagonists, or hold at bay a thousand as poorly

armed as the revolutionists necessarily are. Why they—the revolutionists—cannot arm themselves properly will be explained further on.

By January 20th, it became evident to all that a revolution had started at several points. The first act in the drama at Honda was the seizure of the sixteen miles of railroad to Yeguas by the troops of the garrison. Their subsequent manœuvres were, from a military standpoint, only intelligible on the theory that they had heard definitely of an advance in overwhelming strength by the enemy, for they decided to evacuate the town. They left, "bag and baggage," for Yeguas on the evening of the 26th. The *alcalde* accompanied them, being a partisan of the government, of course.

Thus a town of about seven thousand inhabitants was left absolutely without protection against lawlessness and revolution except such as could be hurriedly organized by the citizens from their own numbers. But worse than that, the most important place to the government, after the capital,—one easily defended by a small force of the enemy,—was abandoned without as much as a *vidette* left behind. Surely such a move could only be justified by the most powerful reasons of expediency. On the contrary no such reasons existed. Not a single armed rebel appeared upon the scene till forty-eight hours later.

On Sunday, the 27th, a squad of soldiers returned from Yeguas, with two engines and some cars, for provisions. The *alcalde* returned with them. He was requested by leading citizens to remain in authority, being assured that he would be allowed to depart in peace should the liberal forces occupy the town. He did remain but kept himself in hiding.

On returning to Yeguas that evening with their provisions, the second train was wrecked about a mile from Honda, by the removal of some spikes on a curve, the engine being thrown into the ditch and the cars derailed. Only the engineer was injured.

This was the first overt act of the revolutionists at this point. By it the troops were but little embarrassed, having another engine and the track in order to within a mile of Honda. Yet the next day they embarked the command and passed down

the river, abandoning the whole region, to all appearances. This same day the advance of the liberal forces entered Honda on a boat, from the upper river, followed the next day by about eighty men who took formal possession of the town. They were poorly armed. About one-third of them had rifles of various calibres and descriptions, or equally nondescript shotguns, while ammunition was very scarce, and generally worthless "misfits." The rest were armed with machetes—a heavy knife about twenty-four inches long, used for the variety of purposes, that, in our country, would require the sickle, scythe and the axe. Almost every peon has one of these slung to his thigh at all times. Bill hooks were also among the improvised weapons. The leaders had swords and pistols. They were totally unprovided with supplies of any kind, depending for subsistence upon their sympathizers or forced contributions from their opponents.

This then was the enemy that caused two hundred well-equipped regular troops to give up, without a blow, the key to what must sooner or later be the chief theatre of war. It was most astounding, and had the liberals been strong in numbers and arms it must have proved disastrous.

Once afloat on the river the courage of the troops apparently returned, or at least, better judgment prevailed, and they tied up to the bank a few miles from Yeguas. Here they learned through sympathizers that the enemy was not much more than a boo-ga-boo. They returned to Yeguas Tuesday night, the 29th, and the next day despatched about sixty men under a plucky young officer who, about noon, fell upon the unsuspecting rag-tag-and-bobtail force of liberals and drove them flying out of the town. The skirmish was lively for a few moments. The troops fired promiscuously in all directions and at everything they saw. The frightened citizens fled to cover and closed doors and blinds, but not before several innocent persons had been shot. The liberal "army" did not contest the ground. They scarcely fired a shot, though two well armed men at each of the three bridges of the Guali River (which runs through the center of the town) could easily have stood off the invaders. Having no outposts out toward Yeguas, the rebels were completely surprised and stampeded.

At the Casa Consistorial (the city building) the troops shot three unarmed persons who had taken refuge there, killing one outright and in cold blood. After remaining until toward evening these troops were returned to Yeguas, leaving the town to again shift for itself. They left one soldier in the hospital, who was, it seems almost certain, shot by one of his nervous companions in arms.

On Thursday, the 31st, a few more troops and some of the officers returned to Honda, and began to levy contributions on the liberal merchants, men whose only offense was that they did not belong to the government party. From this on, the town was held without interruption by the government.

Reinforcements from Bogotá began to arrive the next day and continued all night. As the several "battalions" came in they announced themselves by cries of "Viva la gran Partida Conservadora," "Viva la paz," and other "vivas" to their generals, together with the discordant playing of their brass bands, which stationed themselves in the plaza, and from one A. M. took turns—each performer, in the darkness, going it blind—in making night hideous to all and a terror to many. Had they but given fair warning by commencing with that always inspiring air "We won't go home 'till morning," etc., the three Americans present would have accepted the inevitable, in a patriotic game of "draw," as sleep was out of the question. But the bands down here are not up in classical music.

The next morning presented the plaza and streets full of irregular mounted and foot soldiers, generals, aides-de-camp, orderlies and trumpeters, all busy as a hen with one chick skirmishing for their breakfast and "pasto" (feed) for their mounts. Among the arrivals were the General-in-chief of the army, Reyes, and two generals of division, showing that the government had at last recognized its danger at Honda.

These arrivals were not regular troops, but volunteers and conscripts, mounted and foot. The former were largely young men of the better class from the capitol, actuated, doubtless, by love of adventure as well as patriotism. They rode horses and mules, usually the rider's property, equipped with all kinds of bridles and saddles, with saddle-bags, holsters, blankets, etc. attached, while the riders themselves presented every variety of

dress, some with complete uniforms of different kinds; others with parts of uniforms, while the majority were clad in the usual fashion of the "caballero" of the country, with high crowned broad brimmed Panama sombrero, white or dark blue "ruana" (cape), and white canvas "samaras" (overall trousers). Some had sporting rifles slung over their backs or to their shoulders; others pistols in their holsters or their trouser pockets. Some of the above had also rusty sabres clanging against their metal shoe-stirrups; others had small swords hooked to their belts, while still others relied on the awe-inspiring machete in case of a "charge as foragers." Though ignorant of cavalry tactics, these young fellows, being all good horsemen, plucky and somewhat used to the rifle, would no doubt give a good account of themselves.

As to the "foot," they were all of a different class,—peons, men seized wherever found, rifles placed in their hands, and literally pushed, *volens volens*, into the ranks.

The only article of uniform at all general among them was the red banded cap which they all wore, not on their heads, but perched on the high crowns of their Panama sombreros, an unique idea surely, but incomprehensible to the foreigner as part of a field outfit. (The quartermaster was evidently "long" on caps.) Clad in the varied garbs of the peon, or peasant, rendered tolerably uniform by sweat and dirt; some shod with "alpar-gates" (sandals), but most of them barefooted; all ignorant, undrilled and unaccustomed to the use of arms, much less arms of precision; all devoid of interest, if not, in fact, sympathizers with the rebels, they were not inspiring. However, being of the same class as the bulk of their opponents, much better armed, and officered by details from the regular army, they ought, if guarded from surprise and stampede, to have done some execution.

The two great political parties of Colombia are the Conservatives and Liberals, the latter being the opposition party since 1876. The ultra liberals are called radicals. These latter comprise the men who aspire to usurp the public offices,—and who foment the appeal to arms. They are found in every community, but find their safest retreats in the ungarrisoned towns of the interior. There the revolt first takes shape. There, with

the telegraph lines cut, they make head without opposition. The self-appointed chiefs, once satisfied that "now is the accepted time," begin to muster their arrays. Rifles, pistols, swords and sabres, of all makes, shapes and times, held against the call to arms, are brought forth from their hiding places, freed from rust and lubricated; while the faithful machete—a most formidable weapon, offensive and defensive—supplies all deficiencies.

Thus equipped the bolder spirits—the "patriots"—repair to the place of muster and, from the ex-soldiers among their number, choose their captain, lieutenants, sergeants and corporals who proceed at once to shove their men into "column of twos" and set out to drum up recruits. As they march through the hut-lined streets, a sorry spectacle of the "pomp and circumstance of war," the roll of the resurrected drum draws forth the entire populace and sounds to "let loose the dogs of war"; others fall in at the tail of the column amid the "vivas" of the juvenile horde of children of nature, who take it for a great "feast day," no doubt marvelling at the absence of the black gown of the "cura"; while the report goes forth, not on the wings of the wind but by every passing traveller and pack train, that the town has "pronounced."

Thus the revolutionary "army" springs into existence. The detachments are promptly conducted by the chiefs to the general rendezvous, where they are nominally formed into battalions, brigade and divisions, the field, staff, and general officers chosen and *voilà la guerre*.

Lack of rapid communication has made it impossible to keep posted on what has occurred throughout the country. The government holds the telegraph and private despatches are not taken. Only official business passes over the lines that are working. This much is known however.

On January 29th, General Reyes met the rebels at "La Tribuna"—a point on the great plain on which Bogotá is situated where the road first begins to descend. It is about twenty miles from the capitol. After a fight of several hours the rebels, under General Sarminento, retired.

Two days later there was a fight at "El Chicoral" on the west side of the upper Magdalena about thirty-five miles above

Honda. The rebels were again driven off, but the action was not decisive.

On February 1st, a large force of the rebels were caught in ambush by the troops under General Camacho at Papaia, near Ibague and routed. In all these fights it is impossible to get figures of killed and wounded that are reliable.

The reports of numbers of troops engaged, and revolutionists killed, wounded and captured—given in the bulletins issued by the government or its generals,—are full of exaggerations, doubtless intended to discourage the vacillating. I have found that dividing by four gives a pretty fair approximation to the facts. The casualties in the above engagements were not serious, probably less than one hundred in the first two and less than two hundred at Papaia. This does not include prisoners which were probably about the same in numbers respectively, and all rebels.

Early in February, General Reyes sent commissioners out to the rebels north of Honda, who held the steamers of the upper Magdalena, proposing a surrender under very favorable terms. It was successful. A large number of rebels, perhaps five or six hundred, accepted the terms, surrendering the steamers, and giving up their firearms and ammunition, but retaining everything else—their side arms, saddle animals, etc.—and receiving safe conducts and full pardons (in writing) to be respected as long as the holders remained neutral. I am glad to be able to state that this most gracious action of the general was approved by the president and the terms have been entirely respected.

With this surrender, all Tolima and Cundimarca became quiet and orderly. Telegraph lines were soon working in all directions in those departments and the general impression was that the revolution was about played out.

On February 12th, General Reyes embarked about four hundred men on steamers at Yeguas for Barranquilla.\* He left at Honda some troops that arrived from Antiochia for that duty.

\* This city lies near the mouth of the Magdalena, and is the chief port of entry of Colombia. The mouths of the Magdalena are not navigated. It is connected with Puerto Colombia, the actual seaport, by a railroad of eighteen miles. Here, seventy-five per cent. of the exports and imports of the country pass.

The general's bulletin, on leaving, stated that all being quiet in the interior he wished to visit the coast, though not because of trouble there. As usual his number of troops was much too high, his "twelve hundred men" embarking being not over one-third that number, according to my count.

He made a triumphal procession of six hundred miles, the stillness of tropical nature occasionally broken by the "vivas" of the scantily dressed denizens and shouts of the naked children of the thatched villages *en route*, and arrived safely at his destination where a "grand reception" awaited him. There he found matters not by any means, favorable. The town was menaced by several large detachments of rebels occupying outlying villages. Santa Marta, on the coast to the East, was also largely liberal, and threatened by a force of rebels near by, who later took possession of the town.

After issuing several congratulatory bulletins at Barranquilla and hurriedly arranging for the defense of that important point, the general ascended the Magdalena with a force essentially the same as he brought down. He disembarked at "Puerto Nacional," about three hundred miles up the river on the East side, the point most convenient for entering the departments of Santander and Boyaca,—lying north of the capital.

From the very first rumors of serious trouble in Santander, along the Venezuelan border, have been current. But as the telegraph lines from there pass to Bogotá and thence to the other departments, it has been impossible to know the facts. I learn however, from a most reliable source, that the rebels in Santander are aided and abetted by the Venezuelans along the frontier. There have been at least three invasions by them across the border.

As Venezuela has lately purchased a large lot of modern small calibre rifles—forty thousand, it is said—and the scheming liberals of Santander are promising their neighbors across the line that, in the event of their (the liberals) success, the pending question of the boundaries between the two countries at that point will be quietly dropped, there is believed to be more danger to the government in Santander than at all the other points put together.

But more than this, across this frontier is about the only way

the rebels can secure arms, and they are, no doubt, getting some that way.

The government since the last revolution has absolutely prohibited the introduction of rifles and ammunition into the country. Therein has been its safety. The prohibition has been rigorously enforced. A like prohibition obtains in all other Spanish American countries with which I am acquainted. Foreigners have had great difficulty in getting their sporting rifles in, so strict is the surveillance in this particular. Hence it is that the liberals are so devoid of arms. They have the money, but cannot get the arms into the country.

General Reyes entered Santander early in March, but at this distance, we cannot tell what has occurred there. He asked for more troops however, and three hundred, under General Torrente, started from Honda about March 5th. They proceeded to Bodegas Central where they disembarked, presumably to march to General Reyes. But the situation was so alarming at Barranquilla that they were, after two days, hurried to that place, where they arrived just after the fight at Baranoa, a small thatched village about twenty miles south,—which took place on the 11th of March.

At Barranquilla the situation was this:—Three bands of rebels held outlying towns, while a fourth was said to be approaching from Santa Marta. On the 9th instant a small party of rebels rode into the hamlet of Puerto Colombia—where the great 4000-foot iron pier is—firing their revolvers in the air and whooping like wild Indians. Though there were less than twenty of them, they frightened a guard of sixty volunteers of the government into surrendering.

Thereupon General Palacio, the commandant at Barranquilla, decided to move against them. He sent out about 250 men, foot and horse, who found the rebels at Baranoa, awaiting them. The rebels seized the church in the plaza and from it opened such a fire upon the troops after they had well entered the plaza, that they took refuge in the adjacent houses. They soon, however, made the church untenable by the rebels, who thereupon decided to fire the building, as the smoke would be blown toward the troops. Thus the rebels made their escape to adjacent houses. But finding it necessary to retire from the

town they again applied the torch, and as a high wind was blowing the entire village was burned. Several persons, they say, were burned to death.

The rebels lost in this fight about sixty-five prisoners. Thirty were killed, all told, and about sixty wounded. Of these the majority were of the troops. Two colonels of the army were among the killed. The battle was entirely indecisive, as was shown by the fact that three days later it was officially reported the rebels in the same general region would be attacked again.

This, then, is the situation up to date as far as it is known to anybody outside of Bogotá. The outlook for a prompt suppression of the revolution is not good. In fact, the best informed now believe it will last for months, and many think the outcome doubtful.

It would seem, however, that the revolt must ultimately fail, because of the lack of arms, and the almost insuperable difficulties in the way of the rebels in securing ammunition.

In the meantime the country is suffering enormously from stoppage of trade and business, and lack of the usual employment for the masses.

#### TAKEN PRISONER ON THE ROAD.

During the final occupation of Honda by the government troops,—a long, dreary interval of stagnation in business and cessation of steamboat service on the Magdalena which kept me from leaving the country,—I used my camera, as a pastime, on martial scenes in the plaza and streets and occasionally made short trips into the mountains for views.

One day I set out to get a view of a particularly curious stretch of the road to Bogotá, distant about two hours mounted journey. After starting, my mule—a fine, large animal, my own property—became suddenly lame and got worse so rapidly that when about a mile from the point I was headed for, she could hardly walk. I availed myself of a convenient hut and tied her where she could not be seen from the road, well knowing that parties of either side were likely to pass during my absence. I also left my “ruana”—a fine cloth cape like a poncho, only much longer—concealed inside, where the

old woman of the hut thought "las tropas" would not find it. My lunch—of which two bottles of American beer was the chief part—was left in my saddle bags on the mule.

Having gone leisurely to the point and when about to take my views, I heard shouts away down the mountain from the same direction as I had come and resolved to wait and take the party in. Imagine my surprise when the party finally rounded into sight to see my mule burst into view, hobbling on three legs, carrying a sergeant and a lot of plunder and heading a squad of about a score of uniformed troops, two of them detailed to prod, and all, (more or less) yelling at that disabled animal! Need I say that my resentment was deeply stirred? I waited in the trail till about to be run down and commanded "Halt!" They halted and the sergeant heard my brief claim to his mount and mild request that my property be restored to me forthwith. His reply was to command, "Forward, march!" and wave me contemptuously out of the road, which was not wide enough for him to pass around me, being, at that point, simply a long steep cut worn in the rock by the countless thousands of animals that, for more than two centuries, have struggled up and slipped down that precipitous, winding trough.

Thereupon, I changed my tactics, and began a series of emphatic and threatening gesticulations, at the same lifting up my voice in a combination of bad Spanish and worse English, that, without doubt, greatly alarmed the mule at least; for she, from carrying me on many long journeys, had come to know me as a mild-mannered, gentle master. She wheeled about, nearly throwing her rider, and was only prevented from attempting to fly by his men. The worthy sergeant,—like his men, somewhat the worse for the mixtures of "guaro" and "chicha" levied on the "tiendas" and "posadas" along the march,—now deigned to dismount and said he would await the arrival of his officer, whose approach he, no doubt, argued from the distant sounds of a hurrying horseman. Meanwhile I was informed that I was his prisoner and warned of the dire consequences of any attempt at escape.

A lieutenant of infantry, mounted on a winded and suffering horse, soon appeared upon the scene. Why he had intrusted his command to the sergeant was perfectly plain from his con-

dition, which also argued well for his horsemanship. He was gloriously drunk, a fact that I noted with some misgivings. He heard the sergeant's report of his capture of the mule and my interference with the peaceable passage of the troops along the public highway, and, dismounting, demanded my passports for being on the road. As I had none, he informed me with scant ceremony that I must accompany him to Guaduas,—a long day's ride farther on—where his chief would adjudicate my case, which he declared a serious one.

In my dilemma, I resolved to return the "soft answer that turneth away wrath" and begged leave to compliment him on his military knowledge and bearing and to ask if he were, possibly, a graduate of the military school at Bogotá of which my friend Lemly was the organizer and, while it lasted, the chief. This proved a happy stroke, for it turned out that he was from that school and the softening effect of the knowledge that his prisoner was not only a graduate of the U. S. Military Academy but a former mess-mate of Colonel H. R. Lemly,—such was Lemly's legal rank in Colombia—for whom he professed the greatest love and admiration, became at once evident. I was immediately released from arrest and became the object of most demonstrative marks of consideration and was assured that, not only my mule, but himself and his command were entirely at my disposition,—the polite formula of these people, in this case at least, more formal than real. Indeed there followed a genuine love-feast, to judge by appearances, which must have caused the sergeant and men to marvel greatly.

After quite a cordial, not to say maudlin, chat the lieutenant expressed his regrets at the necessity of tearing himself away and after embracing me and patting my back in true Spanish style he, at my request, formed his squad to be photographed in the narrowest part of the gorge, at a "charge bayonets," as if to receive an attack from all directions—this idea was not mine—while he, a little farther up and standing high in his stirrups brandished his sword in a manner truly inspiring if not alarming. He then marched away in good order and apparently well satisfied with himself, leaving me congratulating myself on "a happy deliverance," which was not seriously marred at finding that my saddle bags were empty and that I must

forego my lunch. However, having saved my mule and equipments without the threatened delay and trouble—saddle animals being of all things the most coveted by these foraging parties; and a Whitman saddle, enough to make almost anybody, civil or military, break the eighth commandment—I footed it back to the hut to find that my ruana was gone, the old woman stating that “los soldados” had overlooked it while the eagle eye of the “official” had sought it out. The fact was, that my newly-found friend and sworn protector, who—if I believed him—was ready to die for me, did not think the rules of friendship, not to say honor, required the return of my ruana which, no doubt, was the one I saw without suspecting my property strapped to the cantle of his saddle. I reported the facts with the name of this officer to the general commanding at Honda who with great apparent indignation declared that my property would be returned and the accused severely “castigado”; but nothing ever came of it. Lemly subsequently confirmed the fellow’s claim to being a former pupil of his, but disclaimed any responsibility for his ideas on what constituted lawful contraband of war. Indeed, I may say in this connection, that a large part of the young officers of the regular and volunteer (?) army and a few of those of the revolution were from the *Escuela Militar*.

That institution was patterned, as far as possible, after West Point and in fact, the whole military establishment of Colombia was equally based on our Regular army. The “tactics” were Lemly’s translation of “Upton,” which fact was dinned into my ears at all hours of day and night by familiar trumpet calls; in Honda, where my room fronted the guard headquarters; on the troop steamer by which I went to the coast; and, finally, at Barranquilla where my hotel was less than a square from the barracks,—in short, from the outbreak of hostilities till the Atlas ship *Alene* carried me beyond earshot of land, making in all, three months of torture. Whatever sins of omission were justly chargeable to conduct of the war on the government side, the buglers certainly showed the most untiring industry and the officers and men the most stoical endurance of this form of outdoing the enemy.

## DOWN THE RIVER ON A TROOP STEAMER.

Heaven only knows when I would have reached the coast had not fortune favored. Late one day in the early part of March, a party rode into Honda from Bogotá, one of whom, when sufficient mud had been removed, proved to be H. R. Lemly, 3d U. S. Artillery, who, with the brother of the Minister of War was proceeding to the United States on urgent government business, and had an order to the general commanding at Honda to supply river transportation forthwith. Notwithstanding this peremptory order it was nearly a week before the party got away and then it was with the troops of General Torrente—referred to above—who loaded two steamers to the guards. Through Lemly I arranged to accompany him, the presence of troops making it practicable to carry me as a "prisoner of war" as the general jokingly explained. The down trip is made in five days (as against nine or ten the other way) and, though I slept three nights on the open deck of the steamer sandwiched between the men who covered every foot of the space, I fared better than they from having a portable cot—a great comfort, if not a necessity, to travel in these parts—and good blankets and "got on," as the English say, very well; while, on the last three hundred miles, we had the boat to ourselves, the troops having disembarked at Bodega Central. My status, while not depriving me of anything more valuable than the use, during part of the trip, of a malodorous, flea-ridden cabin carried the advantage of a free passage, for the regulations of the treasury department probably specified no way of "returning" the fare of a prisoner of war.

The men of this command were a singular conglomeration of humanity which might be conceived as the result of a sort of triangular contest for the "survival of the fittest"; the three corners occupied by the pure Whites, Blacks and Indians respectively, from which quoins of vantage each had encroached upon the preserves of the others, producing, after many generations, the endless gradations of mulattoes, half-breeds and mixtures of Negro and Indian blood; the contest, judging from the men in question, having gone, decidedly, to the advantage of the latter mixture.

## A WORD ABOUT THE ROADS.

The trails of the interior of all that extensive country that was first called New Grenada and afterwards became the "Republics" of Venezuela, Colombia, and Ecuador, were laid out by the early Spanish Conquerors, who evidently had a haughty disregard for the hardships of climbing mountains, for they appear to have conceived a line as direct as might be to the point they wished to reach and gone right over all obstacles lying between. Thus these trails, the avenues of a large inland trade, yea, the very "*camino real*" between the Magdalena at Honda and Bogotá, a city of over 100,000 souls, the capital of a population of more than 4,000,000—this highway of seventy miles and ascent of nearly eight thousand feet over which passes a continuous procession of high and low; the president and his "ministers"; foreign ministers and their suites; the Archbishop of Bogotá and his retinue, the lowly *arriero* with his pack-train and the leprous beggar in his sores,—presents the same disregard of easy gradients in crossing the divides of the Andes as the obscurest trail, reaching those dizzy heights by, in most cases, the line of greatest resistance; this "*royal road*" is, in many places, so steep, rocky, and (in the long wet season) slippery that nothing but the patient mule seems to possess the instinct necessary to traverse it with reasonable safety. The obstacles of nature, assuredly serious enough in themselves, have been added to in the shape of stretches of paving put in long years ago,—during the existence of slavery. These cobblestone pavements, of which it may be truthfully said that they occur where least appropriate, *i. e.*, on the most steep and slippery sections of the trail, have as a rule become, from lack of repair, horrible to an extent only conceivable by travelling over them; and to partially prove this assertion it may be permissible to state that, before the person of the head of the church in Colombia is subjected to the dangers of passing over these roads, men are sent forward to remove obstacles and make such temporary repairs as will answer the special occasion. These being practically the only repairs made, they may properly be cited as among the advantages of a union of Church and State in Colombia.

## OUR ASYLUM FOR POLITICAL SUSPECTS.

Having spoken of concealing people in Honda I may as

well give my experience in that line. I occupied a room with another American, who was interested in a mine near there and made Honda his headquarters. Our room fronted on the "plaza" (that open space in the centre of all towns and villages in those countries in which the weekly markets are held), and had, back of it, a couple of other rooms used for storing goods belonging to an adjoining store, kept by our consular agent, Mr. Henry Hallam.

I had taken the precaution to carry an American flag,—the storm flag of our garrison—with me and now resolved to invoke its protection. This act was based on the idea that none of the authorities, civil or military, knew just what rights were granted foreigners, in time of revolution, by existing treaties and that the flag would be respected. This idea proved well founded, for our back room became an asylum for prominent partisans of both sides during the adverse occupation of the town. We fed our guests on canned food from the store and heard no complaints on the monotony of the fare.

First off, we had as guests two prominent liberals. Then, when the troops got scared and left, these came forth and, as stated, the *alcalde* and two leading conservatives sought our protection; and, finally, when the government authority was again established, the insurgent general,—the *levier-in-chief* of assessments on the conservative merchants of the day before,—changed places with the *alcalde* and remained with us several days till, one night, his sympathizers got him out of town in the garb of an old woman. I am satisfied that the fact of these concealments was suspected, if not known, in each case; but no attempts were made to break up the asylum, perhaps for the same general reason that accounts for the absence of capital punishment in most, if not all, of the Hispano-American countries, which reason I fancy to be this:

It is well known that conspiring against the government is the chief occupation of a considerable number of leading citizens of those countries, and recognized that, if any crime is properly punishable with death, treason should be such a crime. Unsuccessful attempts to subvert the existing government have, in all ages of the history of mankind, been thought to merit death, and been so punished, as a rule. Success can be their only

sanction. Now, with the perennial recurrence of these struggles among our neighbors to the south, it was, long ago, seen that capital punishment would soon exterminate the leading families. The incumbents in office, however strongly inclined to "make the punishment fit the crime" as against the actual "insurrectos" foresee that a slight turn of the political kaleidoscope may cause a change of places, which would be awkward.

Again, I had supposed that these hot-blooded people were particularly savage toward their prisoners of war; but, however the case may be as against prisoners from a foreign army, certain it is that, in this war, they treated captured rebels without unnecessary harshness. Though the lot of such prisoners was not a happy one, still they were not treated with violence, much less killed, nor were towns that had pronounced for the rebels, when captured, given over to pillage, arson, and the ravishing of women. The *rationale* of this,—a fact that will, no doubt, surprise many with their preconceived ideas of the blood-thirstiness of these Latin people,—is, as before, that no one knows but that in the next revolution the tables may be turned and the revolution of to-day become the government of to-morrow.

#### BULLETINS AND DECREES.

After every engagement of importance it is the custom to issue bulletins or proclamations either by the government or the commanding general. These are printed in large type and posted in public places and distributed among the people. Though usually very grandiloquent and full of hyperbole, they are often beautiful in diction and highly poetical. It would, no doubt, be interesting to give one of these in full but they are too long and, furthermore, it would lose much by translation at my hands from the difficulty, the impossibility, of preserving the beauties of expression—the shading of the picture, as it were—for which imaginative Spanish is justly noted.

I would have liked also to give a copy of a "Decree" for contributions to show the form as well as the peremptory, autocratic nature of those engines of oppression. They fall with the greatest severity on the adherents to, or sympathizers with, the opposition; are issued by both sides of the struggle when occupying a region; and between this upper and nether millstone the unhappy merchant or agriculturist is ground to a pulp

if the contest last long enough. While receipts are given, experience has shown that restitution is limited to those who belonged to the winning side and even they are lucky if they get back the principal of their contributions, especially if they be without influence with the victors. It occasionally happens that foreigners are levied upon for supplies—not money but usually beef cattle—for the army and, so far as I can learn, payment therefor is always forthcoming when peace is restored, even the supplies enforced by the beaten revolutionists being paid for by the government. The foreigner is, however, only called upon from dire necessity. He owes his security to the fact that he may appeal to his country's treaty in collecting his claim, whereas the citizen can only look to the courts which, as shown above, are unreliable if not powerless as against the government. The foreigner is, nevertheless, in danger of loss from having his laborers impressed into the military service for which there is no relief.

The sums demanded in some of those decrees were startlingly high. In one issued at San José de Cutú, nine persons were assessed \$1000; three \$1500; eight \$2000; two \$3000; seven \$4000; four \$5000; three \$6000; two \$8000 and three \$10,000. To be sure, gold was at a premium of 150 per cent., but these sums represented about the same relative amounts of comforts there that they would here in gold. By decrees it was possible to ruin an enemy completely who could not be otherwise reached.

#### IN CONCLUSION.

The Colombian regular army was, as far as I could judge, fairly well organized and officered. Its state of drill and discipline was also creditable. I studied it somewhat before the outbreak of the revolt and saw a good deal of it in active service. It was armed with the Remington rifle, cal. 45, and was well uniformed. The supply departments seemed to me very defective, but it must be remembered that it is the nature of tropical people to be improvident. That inborn trait must be a fatal bar to systematic preparation for maintaining armies in the field. Furthermore, the climate being always mild and nature prolific in supplying simple foods, the mass of the men have become used to but little in the way of comforts, as we un-

derstand them, and much may be expected of them in looking out for themselves. Still they were decently fed at all times. Their food was rice, black beans—"frijoles"—and, last but not most constant, the plantain; while fresh beef was provided whenever cattle were to be found. The cooking, though poor, is acceptable to them. Fresh meat is, indeed, a universal craving. The idea that tropical people live largely on fruit is as erroneous as it is prevalent among those who have imbibed it from their geographies. This is true, at least, of tropical America. Fruit is abundant and in great variety. Much of it is never seen above the latitudes of frosts, as it is so perishable that it will not stand a day's transportation; but the peon,—the peasant,—does not care for it and it constitutes but an insignificant part of his food. Bananas are usually eschewed because they are believed to be productive of fevers,—"*calenturas*." But the plantain, which is always picked green and eaten cooked, is the staple food with all classes just as the potato is with us. It grows everywhere, requires no care and costs next to nothing. It is deservedly given the place of honor, being of high nourishing qualities. Indian corn,—maize,—is also a great favorite, but it is always dear. Ground by hand into a coarse meal and made into cakes,—tortillas,—it is a food of deadly greasiness and toughness to the foreigner.

Beef, from necessity, is usually stewed. No notion of cutting up a carcass systematically is anywhere found. The flesh is simply cut and hacked off in any way, shape or manner. Such things as steaks, roasts, etc., are not known or dreamed of by the mass of the people; and even in the houses of the wealthy residents of the capitols it is known to but few.

Finally, I will say that I have always been treated with courtesy and consideration everywhere in Colombia and Costa Rica. All officers, both civil and military, have been polite, while some have placed me under many obligations for their kindnesses. Those countries are, at least, governing themselves. They are working out their own salvation, and every friend of the republican form of government must sympathize with them in their difficult work and wish them Godspeed toward the day when they shall live under that form in fact as well as in name.

## SOWING WITHOUT REAPING.

BY FIRST-LIEUTENANT WILLIAM H. JOHNSTON, 16TH U. S. INFANTRY.

DURING the past three years it has been the duty of the writer to serve at two of the institutions at which military instruction, practical and theoretical, is given. One of these \* is a boarding school at which the routine is assimilated as closely as possible to that prevailing at the U. S. Military Academy; the other,† a university located in the heart of a large city, the curriculum of which is necessarily more advanced‡ than at the former, but since the students are "day scholars," the time available for military instruction is necessarily much less.

These two may be taken as fair types of the institutions to which under existing legislation and orders, in pursuance of a liberal and enlightened policy, our Government furnishes ordnance and instructors entirely free from expense.

In the year ending June 30, 1897, 15,608 students received military instruction at these institutions.§ It is the theory of our Government that from among this class of military novices will come a portion of the officers for our volunteer forces in the next war. Our Regular Army contains among its enlisted men excellent material, but not sufficient numbers of volunteer officers. Our National Guard even cannot supply the anticipated demand. Veterans of the last war will soon have become too old and feeble to lead armies, perhaps even to train troops at home for the front.

Hence the necessity of teaching the coming generation the art of war as we have learned it, of sowing in their minds the seed of military science, and in their hearts a love for country and flag, that they may cherish above the enervating pursuits of peace all that is noble and manly in war.

\* Western Military Academy, Upper Alton, Illinois.

† St. Louis University, St. Louis, Missouri.

‡ Authorized to confer the degrees of A. B. and A. M.

§ Annual Report, Adjutant-General of the Army to the Secretary of War, 1897.

EFFICIENCY RECORD.  
1897-98 COMPANY "D," ST. LOUIS UNIVERSITY CADETS.

NAME.	Rank.	Enlisted.	Class.	1896-97.		OCTOBER.											
				Score.	Character.	1	4	6	8	11	13	15	18	20	22	25	27
P. C. Guignon .....	Captain.	March, 1894.	Philosophy.	880	Excellent.				AE			late					
A. J. Poulin .....	1st. Lieut.	March, 1894.	Philosophy.	760	Excellent.									AE			
F. J. Rudden .....	2d Lieut.	March, 1894.	Philosophy.	400	Good.												
C. J. Chambers .....	1st Sergt.	Sept., 1894.	Second Commercial.	740	Excellent.												
T. F. Davis .....	Sergeant.	Sept., 1897.	Rhetoric.	{ Served from Feb'y, '94, to May, '96.													
J. M. Connor .....	Sergeant.	Sept., 1894.	First Academic.	840	Excellent			AE									
J. A. McDowell .....	Sergeant.	Sept., 1894.	Humanities.	660	Good.												
J. A. Kinsella .....	Corporal.	Sept., 1897.	Philosophy.	{ Served from March, '94, to May, '95.													
L. H. Walsh .....	Corporal.	Sept., 1897.	Philosophy.	{ Not a cadet.						late							AE
W. F. Ralph .....	Corporal.	Sept., 1897.	First Commercial.	{ Not a cadet.													
J. J. Walsh .....	Corporal.	Sept., 1896.	Second Commercial.	{ Served from Feb'y, '94, to May, '96.					D								
Brennon, R. S .....	Cadet.	Sept., 1897.	Rhetoric.	{ Not a cadet.													
Casey, Morgan .....	Cadet.	Oct., 1897.	Second Academic.	{ Not a cadet.				AE					A	D			
Dillon, A. J .....	Cadet.	Sept., 1897.	Second Commercial.	{ Not a cadet.			late										
Fleming, J. .....	Cadet.	Sept., 1897.	Second Academic.	{ Not a cadet.													
Foley, W. J. .....	Cadet.	Sept., 1897.	Second Commercial.	{ Not a cadet.													
Fox, J. F. .....	Cadet.	Sept., 1894.	Rhetoric.	{ Not a cadet.													
Fusz, P. F. .....	Cadet.	March.	.....	{ Not a cadet.													
Grace, W. J. .....	Cadet.	.....	.....	{ Not a cadet.													

Etc., etc., to end of company roll.

Classes in the order of seniority are: Philosophy, Rhetoric, Poetry, Humanities, First, Second and Third Academic, Preparatory.

Also, First, Second, Third and Fourth Commercial.

A Absent without excuse.

AE Absent with excuse.

D Assigned to duty for punishment (extra tours).

So much for the object sought. I believe no one, be he citizen or soldier, will deny that this policy is as wise as it is liberal.

But having sowed the crop, we may fairly ask, is it properly cultivated? and is it ever harvested?

Military science as taught in our colleges seems to me like the seed of which we read in the parable, which fell among thorns and growing up was soon stifled by them. Graduates of our military colleges return to civil pursuits when they doff their cadet uniforms, and only a very few, through service in the National Guard, continue the study of military science, or even retain an interest in war as they learned it. Such instruction is crowded out of their minds by the maddening rush for gold which is entered as soon as, if not before, they graduate from college.

It is the effort of the writer to indicate a few reforms in our system of military instruction which would tend to cultivate the seed we are sowing, and one additional step which would enable us to harvest at least a portion of the crop which results. The former can be secured without any measures more formidable than additional orders or regulations: the latter requires legislative sanction.

#### CULTIVATION.

Under existing orders much that is beneficial and praiseworthy is required. I do not criticise them, except for their insufficiency. I merely recommend additional measures for the attainment of the great end, viz.: the training of officers for future war.

1. Instruction should be aimed at the training of an officer and not at precision in drill. A cadet learns how to command only by experience in command, not by shouldering a gun in the ranks. Hence, our organizations should be skeletons, that as many as possible of the most proficient cadets may exercise command of some kind. Cadets who are required to instruct others learn the theory as well as the practice of the art military. They necessarily study the drill regulations, to avoid mortifying mistakes on the drill ground. This system does not produce "crack drill teams" once thought so desirable, and companies do not drill as perfectly as if they were given all their instruc-

tion by the army officer himself. I find it, however, better to watch cadet officers and non-commissioned officers, and correct their mistakes, than to insist upon mechanical precision in the ranks, which deceives only very superficial observers. Since I came to this school I have increased the number of non-commissioned officers two-fold, in order to adopt this policy, even though to do so I was obliged to abandon the double rank formation. If service as a cadet is made compulsory upon all students, as is advised at present and should be required, and if all officers are appointed from the higher classes, all graduates of these schools should have served as officers in the various grades; and their ability to teach others, and to grasp the rules under which war is waged, is the object for the accomplishment of which we "professors of military science" are detached from our regiments. If these soldier factories turn out good company officers, we are rendering a good account of our stewardship. If we produce only military automata (tin soldiers), we have no excuse for our absence from our regiments.

2. Besides the copies of "reports and correspondence" \* officers on this duty are not required to turn over to their successors any records or information. Consequently, when a change is made in the detail, the new incumbent spends a year, at least, in learning what he should find on record in his office, viz.: the past record and character, present ability and efficiency, of cadets who have had previous service, orders issued in the past, and the mass of customs or practices which have been developed by experience as beneficial or desirable—what we may call the military common-law of the institution. I believe that a file of orders, a set of regulations of the school, if any exist, a file of letters received, a letter book of letters sent, a roster for duty as officer of the day, officer of the guard, if any be maintained, and for duty as trumpeter of the guard, a record of attendance and proficiency at recitations and lectures, and last, but most important of all, a record of efficiency of each cadet should be kept. The last should show when each cadet enlisted, what is his class, what his character has been each term, whenever he has been absent or late, and if so, whether or not with excuse, whenever he has been punished, and for what reason.

\* G. O. No. 93, A. G. O., 1893, page 14.

If all these facts be scrupulously recorded, it is possible for any officer, or for an inspector, to ascertain the military history and probable efficiency of each cadet in the battalion. Such knowledge is invaluable in making selections for promotion. Without it, a cadet with only a veneering of military polish may be promoted by a new commandant over the heads of those who are soldiers to the core, merely because the former has a fine shape and for a few weeks or months is on his good behavior. I speak feelingly because I have been victimized by just such "cigar sign soldiers" at each of the schools at which I have served.

To indicate the style of book to which I refer, I have copied a portion of one page of my "Efficiency Record Book," for this year. At this university, each cadet receives a credit of a thousand points in September of each year. From this is deducted for each absence from drill or lecture without excuse, forty points; for each absence with excuse, twenty points; for each tardiness, twenty points; for each assignment to walk "extra tours" (for misbehavior at drill or failure to wear uniform), forty points. First sergeants hand a written list of absentees to the cadet officer of the day at each drill; these I consolidate, and the Vice-President (Prefect of Studies) notes on this list what excuses are made by absentees, when they next appear at school. Then the proper entries are made in the Efficiency Record Book. The cadet officer of the day reports all cadets out of uniform, or guilty of misconduct, and this report too is entered as above. At the end of each school term (Christmas, Easter and June) this book is balanced, and each cadet's score ascertained; and his general character ("excellent," "good," "fair" or "unsatisfactory") during the term past is recorded. The result is posted on the bulletin board, and a report of each cadet's score and character is sent, through the President, to the cadet's parents. Students who have in June a score above 950 are announced in the annual catalogue. Absenteeism has been reduced by this system more than fifty per cent.; last year fourteen cadets had a record of 960 or more.

Doubtless many of the records above recommended are kept at most schools; my contention is that they, or similar ones, should be required at all schools. Perhaps still more would be

useful; as, a record of Government and school property, guard report book, monthly muster rolls, and others. The individual enterprise of each officer detailed now determines what should be prescribed by orders, viz.: the extent to which records shall be kept.

3. In compliance with existing orders, inspections are now made "near the close of the college year."\* This plan insures a better drilled corps of cadets at the inspection, and consequently a more favorable report, but does it result in the greatest benefit to the institution inspected? The method by which officers are instructed can be studied best while such instruction is being imparted, not when the embryo officer has attained sufficient proficiency to enable him to go through a programme at the close of the school year, and shout out a few commands just as a would-be orator speaks his much-rehearsed "piece" at Commencement. What does any inspector know of a cadet lieutenant's ability to drill a company or command an outpost, or of a sergeant's ability to lead a section or platoon in extended order, by seeing them at their ordinary posts in close order at ceremonies? "Near the close of the college year," our inspectors generally find it impossible to visit all the colleges, so line officers are called into service. Even then time does not permit that more than one day be devoted to the inspection of each college, and frequently this is reduced to a half-day. In this limited time it is possible to judge only the results achieved by the battalion as a whole; methods adopted are not learned. These inspections are certainly beneficial, as the anticipation of a visit from any representative of the Government is an incentive to renewed efforts. For this very reason, if no other existed, they should be made more frequently than once each year. But there is a better reason for frequent inspections.

Errors noticed now, if corrected, by the inspector, are brought to the attention of the commandant, and through him, to that of the cadets, only on receipt of a copy of his report. This is usually long after the close of school, and when the battalion is reorganized in the fall, many of those incorrectly instructed have gone out into the world, and a new set of boys composes

---

\* G. O. No. 93. A. G. O. 1893.

the battalion.\* If inspections were held more frequently, and mistakes noted were corrected at once, the cadets' instruction would not suffer.

I recommend that inspections be held three times each year at each institution, that no set programme be prepared for the inspection, but that each cadet officer drill some part of the battalion and give instructions as well as commands. As instruction now progresses each year from close order to ceremonies, and then to extended order, so should the inspections progress. In October, or November, each school should be visited to see (1) if all cadets are in uniform; (2) if the organization of the battalion is tactical; (3) if the school of the soldier and company in close order are understood; (4) if sufficient time be given to practical and theoretical military instruction; (5) and especially if the methods adopted by the professor of military science are the best experience has taught at other and similar schools.

In January or February the school should be visited again to see; (1) if mistakes reported at the first inspection have been corrected; (2) if the school of the battalion (close order) and the ceremonies of review, inspection, dress parade and guard-mounting are understood; (3) if individual cadets, selected at random, are instructed as sentinels; (4) if signalling, and artillery or cavalry detachments are maintained, to test their efficiency.

In April or May, the third inspection should include (1) correction of mistakes in previous inspections; (2) extended order; (3) advanced guards; (4) outposts; (5) camping; and (6) questioning officers on what they have learned in lectures. If all these duties are not properly understood, the inspector should so report, and there would still remain time (May or June) in which to repeat instruction in those portions of the course not thoroughly understood by all.

All this course can be covered in one year, where the instructor is competent and energetic, the drill-ground adequate and the time given to military instruction sufficient. If the instructor is incompetent or lazy, he should be relieved at once, without waiting a year for this to be learned. If the

---

\* At this institution this year, 51 per cent. of my cadets are recruits. Almost all the commissioned officers are new appointees.

institution does not afford adequate drill-ground or sufficient time, the instructor and ordnance should be transferred to some school which appreciates the benefits conferred.

I can already hear the objection that our inspectors are over-worked, and I agree that they are. But the proper remedy lies, not in a neglect of these colleges, but in an increase in the number of inspectors. Either add six majors to the Inspector-General's Department, or detail six line officers for special duty inspecting colleges. Each could visit about twenty colleges, to be grouped so as to avoid unnecessary travel, three times each year, devoting all the school year (October 1st to June 1st) to this duty. From June 1st to October 1st, the same inspectors could be used in the inspection of National Guard camps of instruction. There are now one hundred and seven institutions of learning at which ninety-seven officers of the active list, and eleven retired officers are on duty. Last year seventeen inspectors, staff and line, visited these schools, each school once only. The advantages to be obtained from three inspections at each would be more than three times as great, for reasons just cited, and the only disadvantage would be a slight increase in the detached service list. Even this can be obviated by increasing the relative proportion of retired officers on such duty, and including the six line inspectors in the limit of one hundred "active" officers now fixed by law for college duty.\*

The above suggestions are aimed at an improved cultivation of the seed sowed in our military colleges. They do not involve an appeal to Congress for the successful inauguration of the changes recommended.

#### HARVESTING.

But if our husbandry is imperfect, our harvest is entirely neglected. We sow well; we cultivate only fairly well, perhaps indifferently, and when the grain is ripe and ready for use, we fail entirely to cut it, and it is annually wasted.

We graduate each year about fifteen hundred students from these cadet battalions. Many other cadets leave without graduation, but after two or more years of military instruction and drill. A few drift into the National Guard, though most of those

\* Act of Congress. November 3, 1893.

who would like a continued military career, hesitate to shoulder a rifle in the ranks so soon after sheathing a sword at a military college. At least ninety per cent. do not continue their military studies or drill.

I would utilize this excellent material by giving to each of such cadets an opportunity to compete for an appointment to the U. S. Military Academy under the following or somewhat similar regulations:

1. From each State a number of appointments to be made equal to the number of congressional districts therein as fixed by each census.
2. These appointments to be made as vacancies occur at West Point from the respective States, and the candidates therefor to be selected by competitive examinations.
3. Candidates for these competitive examinations to possess all the qualifications now demanded as to age, physique, etc., for admission to West Point, and, besides being a *bona fide* resident of such State one year, to have attended for two of the three years just prior to the examination an institution at which military instruction is given by a Regular army officer, active or retired. Certificates of such service and of good moral character to be signed by the army officer and presented to the examining board.
4. This competitive examination to include all English branches as at present required for admission to West Point, and all the pure mathematics now included in the first year's course at the U. S. Military Academy.
5. These competitive examinations to be held in each State about February first, by a board composed of one representative from each of the military colleges in such State, or where there is only one such college, of three professors thereof.
6. Questions to be drawn up by such board and all papers of all candidates appearing, to be forwarded with the board's recommendations to the Adjutant General of the Army.
7. The candidates passing with the highest marks to be appointed by the Secretary of War as cadets from the State of ———, and the same number of candidates, ranking next in proficiency, to be appointed as cadets alternate from the State of ———, according to the number of vacancies to be filled.

8. The physical examination to be made by one or more physicians selected by the board, and all expenses of such examination, physical and mental, to be defrayed by the military colleges in such State.

9. Both cadets and alternates to appear at the nearest army post, as at present, March first, for the examination for admission to West Point. This entrance examination should include algebra and geometry and the outlines of general history, in addition to subjects now required.

10. Ten cadets to be appointed from "at large" each year by the President of the United States, preference being given to sons of army officers.\*

11. Each Senator of the United States to have one appointment to the Academy, under regulations at present governing those controlled by Members of the House of Representatives.†

12. All graduates of these military colleges who have not been appointed to the U. S. Military Academy, to be appointed second lieutenants in the National Guard of their respective States, and assigned to the first vacancies following, provided they applied to the Adjutants General of their States and wished to accept such appointment and assignment.

This project would result in an increase of the "at large" appointments to the number once prescribed, a result much to be desired by army boys. It gives to each State two additional appointments, which could be given to boys unable to attend a military college and qualify for the competitive appointments. The consequent increase in the corps of cadets (120) has been recommended by abler writers than myself and by authorities who are better informed concerning its propriety. The increase in the standard of admission to West Point would result in less failures during the first two years. Making the competitive examinations cover the first year's mathematical course, would insure candidates who could stand the strain after admission, and eliminate grammar school cadets whose admission, if gained, leads later to disappointment and failure.

Depriving congressmen of their appointments will not be a difficult feat. Many of them now give competitive examina-

\* Report of Hon. Secretary of War. 1897.

† Report of Supt. U. S. Military Academy.

tions in their districts rather than antagonize a dozen applicants by selecting one without examination. Most of them would be glad to refer applicants to this law which requires two years' attendance at a military college.

Inauguration of the system (excepting the institution of senators' appointments and increase in "at large" appointments) could be deferred until February 1, 1900, that patronage be not taken from members of the present Congress. All vacancies to occur after June 30, 1899, or that will have occurred as a result of the January, 1900, examinations at West Point, could be filled as above proposed; those occurring prior to June 30, 1899, to be filled as at present. Deferring the date would give boys all over the United States an opportunity to enter military colleges and qualify for the competitive examinations.

The project would insure candidates for West Point with some knowledge of the drill regulations. It would encourage rivalry among the colleges of each State in the effort to furnish the best candidates at the competitive examinations. It would increase the attendance and double the interest taken at present in military instruction at these colleges, as it would insure an ultimate reward (in the National Guard) for all graduates of such colleges and the "survival of the fittest" cadets of each State, by their selection for our national Military Academy, and thus make the latter a post-graduate school for all our cadet battalions.

The principal virtue of this system is that it would enable the country to harvest the crop of military graduates which is annually going to seed and blowing away to soils where military training and military virtues are unknown or unappreciated.

ST. LOUIS UNIVERSITY, November, 1897.

## A SERVICE SCHOOL FOR HEAVY ARTILLERY.

BY FIRST LIEUTENANT H. C. CARBAUGH, 5TH U. S. ARTILLERY.

IN selecting the subject of this paper, I am mindful of the fact that we now have in our service a school for Heavy Artillery to which lieutenants of artillery are detailed for a two years' course and that there is great probability that this school will soon be reorganized on the line of concentrating the courses of instruction therein under about four heads, so that each instructor will have a definite amount of instructing to do each year, instead of biennially, as under the present organization. It is likewise fully appreciated that no duty was devolved upon the writer to discuss this subject save such as may arise from interest in the artillery as a profession.

During the last decade the subject of an Artillery School has frequently been commented upon by officers of artillery and direct and pertinent comments and criticisms have been made in discussing our existing school at Fort Monroe. It is not the intention of this paper to follow those lines but to deal with the existing conditions of our artillery service, to show what requirements will meet them, and to indicate what system can be followed in a service school to satisfy these requirements and yet be flexible and progressive in organization so as to insure a healthy development for the future.

Vacancies in the commissioned force of the U. S. Artillery may be said to be exclusively filled by graduates of the U. S. Military Academy at West Point. With one or two exceptions all lieutenants who have graduated eleven years since have been detailed to and have passed through the present school at Fort Monroe. It is assumed in this paper that none but graduates of West Point will in future be commissioned in the artillery. If this assumption prove incorrect and future appointees be uneducated from an intellectual or military standpoint then a new condition would be imposed—that of adopting suitable means to educate such appointees.

The requirements to graduate from West Point Military Academy will probably be advanced rather than retrograded in

the future, due to adopting an advanced standard of admission to the Academy with corresponding gain of time for advanced instruction thereat.

I mention this because I wish to be distinctly understood as believing that no correlation can ever exist or should exist between West Point and a service school for Heavy Artillery. The former is to test the capacity and to develop the physical and mental qualities of those who are candidates for graduation. The latter should be to broaden the professional attainments of the West Point graduate who has passed through an ordeal that has proved him capable of understanding almost any reasonable intellectual task which can be offered by any textbook on any known subject, or to commit and recite, verbatim or otherwise, its written text. In addition the end of the service school should be to produce among its graduates men who possess substantial working knowledge and skill in different subjects, so that the artillery will have a sufficient number to meet and handle the various problems of a modern sea-coast defensive system.

Before proceeding with a delineation of the subject I wish to call attention to the corresponding school in England. It will be remembered that England has two cadet schools, the Royal Military Academy at Woolwich and the Royal Military College at Sandhurst. The age limits for admission to the former are 16 and 18 years and its period of instruction two years, while in the latter for home service the age limits are 17 and 19 years and the period of instruction 18 months. Both schools are characterized by "the brief periods of instruction and the somewhat exacting competitive standards for admission." As the Woolwich school is for the purpose of educating candidates for commission in the Royal Artillery and Royal Engineers, it will serve the purpose of this paper to survey hastily the graduate of that institution. To enter he must reach the required standard in arithmetic, algebra, logarithms, plane geometry and trigonometry, simple mechanics, Latin, French or German, English composition, geometrical drawing, spelling and writing. Also he will be examined in two of the following subjects: higher mathematics—including statics and dynamics without use of differential calculus, simple problems of analytical geometry

and conic sections, German or French, Greek, English history, theoretical and practical chemistry, physics, physiography and geology, and he may be examined in geography and free hand drawing.

This looks like a severe entrance examination, but it should be remembered that it covers little more than an ordinary high school curriculum, that all of the candidates are 18 years of age or under it, that the age limits for entrance to West Point are 17 and 22 years, and that there are college, academy and high school graduates among the candidates for entrance to West Point who have covered all of the subjects required for entrance to the Woolwich Academy, some of whom fail to enter West Point and some of whom fail to graduate, or have lower class standing than their class-mates who have studied elsewhere only the subjects required in the examination for entrance. Consequently it must be concluded that the successful candidate for entrance to Woolwich Academy would have no better chance of graduating from West Point than the average cadet at the latter place.

On the other hand the short period of instruction at Woolwich and its curriculum as compared with West Point leaves no doubt but that the cadet thereat passes through no such ordeal as a West Point cadet does.

After the Woolwich cadet has received his commission in the Royal Engineers or Royal Artillery he may on application enter, some time during his career—usually before he reaches the grade of major—the Royal Artillery College, also located at Woolwich. This institution is conducted by a director and fifteen distinguished instructors, and receives about 125 officers each year who remain for periods of from one month to two years. Each officer takes one of thirteen courses of instruction intended to make a specialist of him.

There are only sixteen two-year men of which only six come from the Royal Artillery. Their course of instruction embraces higher mathematics with its application to gunnery and gun construction only, chemistry and explosives, physics, steam, mechanism and electricity. Remembering that the curriculum of the Royal Military Academy, as to higher mathematics, is very limited, as it does not include even differential

calculus save for those who volunteer, it is evident that higher mathematics in the sense used in reference to mechanics, acoustics, astronomy, and similar subjects is practically an unknown field to the graduate of England's Cadet Military Academy and service school for artillery.

Our artillery officers are educated theoretically to a standard on all matters relating to artillery ordnance and engineering, which enables them without further education in that line to dispense with the assistance of an instructor or any assistance, in fact, save *reference* books in order to solve the problems those subjects will offer.

While these facts are deemed indisputable, it does remain certain that working knowledge, substantial skill, and practical experience in many subjects which they have theoretically mastered is lacking, consequently they need opportunity to broaden their education generally and in their profession especially, and to develop themselves on lines within which they have special aptitude, which opportunity, if improved, would make them useful and especially competent somewhere in the field of artillery,—and I use the term artillery in a broad sense because the profession of an artilleryman really covers the ordnance and military engineering specialist, in addition to those matters executive which are exercised in handling men and in managing a defensive or offensive artillery system. The English service school recognizes this, and takes the Military Academy graduates or others who possess a fair education for the purpose of developing the kind of specialists which the artillery profession requires.

The two-year men are educated to fill positions in the manufacturing departments of the arsenals, in the office of the Director of Artillery, in the inspection branch of the British service in the Artillery College, in the Royal Military Academy, and in similar places for which their successful passing of the two years' course makes them eligible candidates.

In the other twelve courses there are, 1st. The ten artillerymen who, for eight months, work in electricity and chemistry with a view of becoming eligible as inspectors of warlike stores: 2d. The ten artillerymen who for three months take up the elementary principles of electricity, steam hydraulics and ordnance mechanism: 3d. The ten three-months' men who are

gaining a working knowledge of position-finders and cable tests: 4th. The twenty artillerymen who for ten months take steam, mechanism, electricity, and guns, and also attend practice at Shoeburyness: 5th. The remaining eight courses are intended likewise as special training to educate officers who are not Military Academy graduates, or for those who are in the navy and desire special instructions, or for those who for short periods desire a working knowledge in some special line, and the two months' class preparing for examination for promotion.

The distinguishing features of the college are that the officers attending work with definite purposes in view and with corresponding enthusiasm, that the college is magnificently equipped, that the departments are presided over by well-equipped instructors, and that the college brings to its aid the government arsenals, factories and proving grounds, to the end that each graduate has a practical working knowledge of some special subject. In addition, England has a Staff College, where the general subject of military means and methods of accomplishing military ends are studied.

This diversion from my subject proper has been to show what the other great English-speaking nation is doing for her artillery officers, and to recall, relatively and absolutely, the high order of theoretical education which our artillery officers have received at West Point.

An institution to fill the requirements of our artillery service must seek a wider sphere than artillery matters alone. This arises from the fact that in the event of war, as has been experienced in the past, the artillery should be ready to furnish commanders and staff officers who are competent to fill those positions. Theoretical and practical general staff duties consequently must receive consideration in forming its curriculum. It is true that practical application of theoretical training will necessarily be imperfect, yet it must be remembered as has been well said that "while it is a long step from knowing how to do a thing to actually doing it, yet it is a much longer step from *not* knowing how to do it to doing it." Assuming, therefore, that artillery duties and general staff duties should for the present at least be pursued in the institution under consideration, the following principles seem pertinent.

1st. The name of the institution should be "The Artillery College." There is a great deal in a name which affects the dignity as well as the reputation of an institution of learning. Having passed successfully through an academy, further study by an officer at a mere school is unnecessary. If the institution by its curriculum and equipments, by its directors and its instructors is filling its mission, it must truly be a college, and should receive the name to which its worth entitles it.

2d. Those officers who attend an artillery college should be students and not pupils.

To secure this end there should be an entrance examination to cover such parts of the West Point course as will give to the institution or its instructors no excuse for relashing that course over, either on the ground that the officer has forgotten his West Point course, or on the unexpressed ground that the instructor is not capable of, or has not formulated an advanced one. It is plain justice to both institution and the officer sent there as a student, that such a demonstration should be had before study thereat is begun. Indeed, the examination should be an amplified one, for it is a well-known fact that details of a subject are soon obliterated from, and principles obscured in one's mind. A West Point graduate has passed in succession through a course of study intended, as before said, to develop his mental abilities, but working knowledge of the subjects passed over can only be taught there imperfectly. His knowledge of these subjects should be amplified by general thought and reading after graduation, and the results proved by an examination, so that he can devote his time, if unusual opportunity is given him, to learning how to do things practically by repetition of actual work, which will cause his mind afterward to rest on the thing done, rather than on what the text-book says, and thus develop his special ability for the thing undertaken.

3d. Entrance into the institution by a West Point graduate should not be for at least three years after leaving the Academy. There are several reasons for this: First, he should have a full year after graduation during which to take a mental rest. The tension upon most graduates has been most severe, and leaves the majority in a mental and nervous condition requiring abso-

lute rest. Second, the graduate of West Point should then have two years longer for reading, thinking about, and digesting the subjects he has gone over at the Military Academy, and for filling by general information, details of the theory he has been trained in. For instance, to supplement his theoretical mechanics by study of a practical one, like Goodwin's or Peck's. Knowing that within a comparatively short time he must pass an examination of the nature herein advocated, he would be found within two years after graduation, beginning a course of home reading, which after all, is the true way to develop a real student. Third, he should have at least three years to learn something about the service and for determining in his own mind as to what special subject he would like to devote himself.

4th. The departments or courses of the institution should not be padded with text-books, on the ground that officers are required to pass examinations in them for promotion. If examination for promotion is to be a test of capacity of the officer for committing pages of text-books, the answer is that a few months of that kind of study will, as has been done, show that officers can do it, and that no institution of the kind here under consideration is necessary to aid them. If promotion examination is a test as to general competency to fill the grade to which promotion is sought, then the answer is that service in the army with its requirements, and not a service school, is the place to fit candidates for promotion.

5th. Separation of artillery college duties from ordinary post duties, thereby leading to the commandant and instructors being on special duty and to rotation after a reasonable period in those offices. The primary reason for this is to avoid waste of time. It is safe to say that there is no artillery officer under forty years of age but who can take the drill manual of any piece of artillery now in the service, or which will hereafter be added thereto, and in a couple of hours know the drill and instruct detachments in it. Should he continue this drill daily for a considerable period of time so as to have all of its refinements executed with precision and then not use it for six months he would have to read over the manual before drilling it in order to avoid mistakes in drilling. Within the regiment and post are the places to practice drill, and they should exist with this as one

of their main objects. It is also the place to learn the customs of the service, and any attempt to teach them as a feature of a college is not only unnecessary but it would result in localisms which would have to be avoided in going into the broader fields of the service. It is true that a model artillery post adjacent to the college should be available for furnishing facilities and troops to carry out in a practical way those things which will hereinafter be advised as among proper subjects to be included in a curriculum for an artillery college, but joinder of the two will result in loss of time to those who go to the college for the purpose of having exceptional opportunities not offered by model posts from which they come.

6th. Proper equipment of the institution. The failure to have proper equipment and to excuse it on the plea that what is had is better than nothing is simply unworthy of the artillery of a great nation like the United States. Unless an institution can offer facilities and possesses equipment with which substantial and profitable work can be carried on, its existence becomes an absolute detriment to the service in that false views of its importance and of its value must follow to those who don't know the facts, while to those who do know, the institution must be a subject of criticism and even derision.

7th. The departments of the institution should supply means and methods for specialties and have sufficient time set apart for them to become progressive. To this end each officer on entering the institution contemplated by this paper should be required to select one department as a specialty, to which he should devote in laboratory work at least twenty hours each week for periods of nine months each year for two years.

In addition, he should be required to attend lectures with theoretical and practical work on matters outside of his specialty for one and a half hours each day, for five days of each week, during the same period. To this should be added facilities and requirements for library work and home study for about two hours out of each day for six days of each week during the same period.

The remaining hours of the week should be his own. By avoiding mere drill and routine post duties, as already advocated, he would thus secure uninterrupted time to improve

the exceptional facilities which the institution should be able to offer.

To be even more specific as to arrangement of departments the following is suggested :

I. Artillery proper to include ballistics, sea-coast and siege engineering.

II. Electricity and submarine and land mines.

III. Chemistry and explosives.

IV. Steam, mechanism and machinery.

V. General staff duties to include military history, art of war, field organization, field engineering.

The specialist in each of these departments would have actual work of about four hours each day, and in addition as to the other four departments he would have about one and one-half hours each day for about four and one-half months for each department. The result of such an arrangement would be that the specialists would work with enthusiasm and pride, and the departments must be progressive in order to furnish them profitable employment for so long a period as two years. In addition to knowing one subject well, even being expert in it, the specialist would have his general professional information substantially broadened by his four and one-half months in each of the other departments.

8. Placing the performance of all work on the basis of duty and exacting a standard of proficiency for graduation.

The standard having been reached no anticipated comment, such as class standing, distinguished standing, or honor graduation should be allowed to befog the student's aim to improve himself by revealing his lack of knowledge and his weak points in the subject being pursued. The opinion of instructors should never be officially called for or filed away. Their point of view is necessarily narrow and their opinions unnecessary for official purposes. If graduation by reaching the required standard is not sufficient evidence of proficiency desired, then the standard should be raised until it becomes so. The students will not object, while the avoidance of the comments referred to will do much to produce real students and prevent relative and artificial standards, whose value is fictitious, from becoming official records purporting to have real and absolute value.

In conclusion, it may be said that neither essays nor approved curriculums can define the limits of an artillery college, but the principles herein set forth will form a foundation upon which a useful and progressive artillery college can be built.

## Reprints and Translations.

### A VISIT TO THE NINTH (FRENCH) CUIRASSIERS.

BY MAJOR C. E. DE LA POER BERESFORD, WILTSHIRE REGIMENT.

(From the United Service Magazine.)

**H**OHENLINDEN, Austerlitz, La Moskowa, Fleurus, are the names of the battles inscribed on the guidon or flag of this famous regiment, but those of Jena, Dresden, Friedland, Eckmühl, Essling, and Wagram, at which it assisted, might with equal right be thereon displayed; whilst the glorious part taken by the Cuirassiers in the unfortunate battle of Reichshoffen (Woerth) is, as far as valor can make it, as bright a page in the military history of the regiment as any of its victories.

The 5th Cavalry Division, headquarters Rheims, is divided into three brigades, each of two regiments, viz., Cuirassier Brigade, 4th and 9th Cuirassiers; Dragoon Brigade, 14th and 16th Dragoons; Hussar Brigade, 2d and 4th Hussars. In all six regiments, or, say, 4800 sabres. The 9th Cuirassier Regiment, quartered at Noyon, forms part of the 4th Cuirassier Brigade, of which the other regiment, the 4th Cuirassier Regiment, is stationed at Cambrai. It is composed, like all French cavalry regiments, of five squadrons. One is the depot squadron and is left behind in time of war; it would, after strengthening the other four squadrons, remain at home to train recruits, absorb convalescents, etc., to fill up gaps in the ranks. Each squadron is commanded by a captain, and numbers, say, 170 sabres (200 at war effective). The captain is charged with the entire work and responsibility of the clothing, equipment, and instruction of his squadron. The majors—who are called *chef d'escadrons*, with an "s" to denote that they command two squadrons—see that instruction in their squadrons is carried on in similar fashion. They do not, however, interfere with the captain's command, and at general's inspections the inspecting officer expects all information from the squadron leader (captain), and holds him personally responsible for its efficiency. This, it will be seen, is a considerable step ahead of us as far as decentralization is concerned. It will be remarked, however, that a great deal of the work, which with us falls on the quartermasters, falls on the captain, who has his squadron store from which he, not the quartermaster, issues everything to the men on requisition. Similarly, the riding-master's duties are performed by him, or his lieutenants. His time is fully employed! The only drawback to this excellent system is that the work is almost too much for one man to perform. If he is very careful as to his stores, and minutely

supervises his squadron sergeant-major (who does our quartermaster-sergeant's work), he will probably not have enough time to devote to the tactical instruction of his squadron. If, on the other hand, he more particularly interests himself in the complete tactical efficiency of the squadron, its equipment and clothing may, perhaps, not receive all the attention which they demand.

There is a disposition in France to run down the French cavalry, which seems neither patriotic nor warranted by circumstances. Few nations, and least of all those who may some day oppose this cavalry in action (very unlikely in our case), can afford to undervalue this arm in the forces of our Gallic neighbors. Of course one cannot dispute the disadvantage of the very short service in France to her soldiers. General Bronsart von Schellendorf, himself of French Huguenot extraction, said quite recently that the marching past, the precision in military exercises, the handling of arms, had not suffered in Germany by the adoption of the two years' system; but he did not fail to add, "Unfortunately, it is not the ability that men display in such exercises, important though it is, that wins battles. What we want are men trained to think and act for themselves, and capable of using their arms to advantage under all circumstances of battle. One must have soldiers who set an example to their younger comrades when the officers, being disabled, fail them; who do not hesitate then to come from behind their shelter and take command; who, mortally wounded, will still have the energy to reload their pieces and carry some adversary along with them into the warrior's temple of fame. Can that be taught in two years, or in three? That is the question."

The time at a French cavalry officer's disposition to make a soldier is only three years. Now to make a really efficient infantry man in that time out of a raw recruit, is, as we know, no light task; but to expect that in thirty-six months a man can be taught to be fond of his horse, to know the animal, to groom and get the full value out of his mount, when possibly on joining he did not quite distinguish between its head and tail; besides learning how to ride, shoot, use his sabre, and a hundred and one other details, is in my humble opinion almost impossible. It must be that in so short a time a relatively lower standard of excellence will perforce satisfy the instructor. Yet, as short service is universal now, the German, Austrian, or Italian soldier has no longer time than this, and young soldiers will be met by young soldiers. We are fortunate in being able to keep our men for even seven years. Amongst young soldiers those of France hold a high place, and their cavalry has always had a record of glorious traditions. At Hastings or Senlac the cavalry, dismounted, drove back the Anglo-Saxons. At Crécy it was not the cavalry which could not face the English arrows. The French knights were among the bravest in the Crusades. At Rocroi, Steinkirk, at Fontenoy, the cavalry rode well home. At Marengo a well-timed charge routed the Austrians. Before Jena and

Auerstadt, the cavalry "lifted the veil" for Napoleon. At Austerlitz the Cuirassiers and light cavalry overthrew the Russian Chevalier Guards. At Quatre-Bras, Kellermann, the hero of Marengo, charged our 69th Regiment, and one of his mail-clad horsemen took its color. At Solferino the Chasseurs broke an Austrian square. In 1870, the French cavalry sacrificed itself with useless heroism on several occasions. What cavalry in Europe has a past superior, if even equal to this? French writers are wrong in contending that such a cavalry with such antecedents can prove other than a formidable adversary. The arm in France consists of 13 regiments of Cuirassiers, 21 of Chasseurs, 14 of Hussars, 6 of Chasseurs d'Afrique, each regiment having 5 squadrons; and 8 companies of *Cavaliers de Remonte*, of 299 each: which gives a total of 425 squadrons. The mounted gendarmerie muster in addition nearly 11,000 sabres.

But to return to my visit. The colonel of the regiment, an officer of long and distinguished service, who speaks English, was kind enough not only to allow me to visit his barracks or *quartier de cavalerie*, but to accompany me himself, an honor which I fully appreciated. After a very excellent breakfast at the house of one of the majors, an old friend, we proceeded to the *quartier*. It is situated on an eminence a little to the north of the picturesque town of Noyon, whose splendid old cathedral watches over the little houses beneath, like a hen over her chickens. The barracks are named Cambronne, after the famous general who behaved so gallantly, and gave us so much trouble on the 18th June, 1815. The site is a very fine one, commanding beautiful views of the wooded country around, which abounds with game, deer, wild boar, partridge, etc. The absence of any officers' quarters strikes the English eye; all the officers, married or single, live in the town. As you enter the gate you see an enormous open exercising ground, with a soft ride all round, planted with trees, and with jumps at intervals. Immediately to the right is the fencing-room, or gymnasium, and to the left the *salle d'honneur* and the room which the officers use as a sort of ante-room, for there is no officers' mess in the barracks. To the left and right are blocks with stables and one cook-house behind. Each is for two squadrons. At the north end, facing the entrance, flanked by the buildings referred to, is a handsome pile with a clock tower. Here are located the 5th squadron and all the details—officers, married sergeants' quarters, saddlers', tailors', cobblers', shoemakers' shops. Behind this again are the four riding-schools, one for each squadron, lit with gas, and also open *manèges*. Here also are the veterinary department, the forge and forage sheds, and small buildings. I will endeavor to describe all of these and their arrangement in detail.

On entering, we were conducted first of all to the *salle d'honneur*. This exists in all barracks in France, and is used as a reception-room, much as our ante-room. It is not, however, furnished as a sitting-room. On the walls are pictures relating to the regiment's career, and a frame

containing a list of the officers who were at Reichshoffen (Woerth), and also another with a letter from General Cambronne, dated from Ashburton. He says, "I am prisoner, with a bullet-wound in the head; but shall be fit for work again in a fortnight." Here are the guidons or flags of the regiment, red, white, and blue, with the names of the four battles above alluded to. There is also a fac-simile of the guidon in Louis XIV.'s time, light blue, with a shining sun, and the motto, *Nec pluribus impar*; when the regiment bore the name of Anjou, which was changed successively to Aquitaine, Artois, and 9th Cavalry; until the 24th October, 1803, when it became the 9th Cuirassiers. Several other flags carried by the corps decorate the walls of the *salle d'honneur*, as do also pictures representing the various uniforms worn by it. It may be mentioned that the present full dress is a helmet with black horsehair tail behind, falling down the back, and red plume at the side; the cuirass, worn over a dark blue tunic with red facings, white metal buttons with a grenade; red overalls sewn with leather. The officers wear red breeches, with broad dark blue stripe, and boots with hunting-spurs. The men in walking-out dress wear a sort of artillery tunic, with rows of buttons and red overalls and helmet. On leaving the *salle d'honneur* we were shown the officers' sitting-room. Then came the canteen, where wine, cider and beer are sold, and also sandwiches and light foods of sorts. This is not worked as with us by the officers, but is farmed out to a contractor, into whose pocket go the profits. As a matter of fact it is doubtful if any French officers could find time from their numerous duties to perform the work of canteen president. It seems a pity that all the profit should go to outsiders. After the canteen we saw the sergeants' mess, very nice and comfortable; and then we moved to the 1st squadron stable.

The four stables are exactly similar, and have room for about two hundred horses each. They are extremely clean and well ventilated, with wooden roofs over lattice girders, and glass louveres or windows, which can be opened or closed at will. The horses are separated by swinging boards, and are bedded down in plenty of beautiful wheat straw. Their bedding seemed perhaps cleaner and sweeter than that of regiments which I have narrowly inspected at Aldershot. There is not so much use made of the old, ill-smelling bedding as with us, which, however much it may be turned and aired in the sun or wind, is always full of ammonia, and insanitary. The men seemed to have a good way with horses. The latter were fine large animals, mostly from Normandy; some were much better than others, with plenty of bone, but maybe a little wanting in blood, but a very good, useful class of horse. They need to be weight carriers, as they have to carry one hundred and forty kilogrammes or twenty-one stone. I noticed the quality of the hay; it was excellent. All the horses wore their winter coats, which were, as a rule, heavy, but were well groomed and looked healthy and fit for everything. Some of the officers' and sergeants' horses had their bodies clipped

but their legs coated, as hunters are seen in Ireland. In the stables there was scarcely any smell, and the drainage seemed perfect. It must be remembered that this barrack is one of the newest and best.

From the squadron stables we passed to the cook-house. The meat, potatoes, and vegetables, were all very good. The cook-house serves for two squadrons, or say four hundred men. The ranges are stoked up from behind near a door, which allows all dust, cinders, etc., to be easily got rid of without dirtying the cook-house, and saves labor. There is a regular bill of fare for each day; thus the same food is given every Monday, and so on. The meals consist of coffee in the early morning; meat meal with vegetables at 11 A. M.; meat meal with stew and vegetables at 7 P. M.; 1¼ lb. of bread and about 1 lb. of meat per diem per man. The meat and vegetables are stopped from the men's pay, for which a daily charge of 3½*d.* is made, reducing the available daily pay of the soldier to ½*d.* per diem. The food seemed to me to be decidedly superior in quantity and certainly equal in quality to that of the British soldier. It should be remembered that although the French soldier's pay seems to us very small, no deductions for clothing, library, hair-cutting, etc., are made from it, and moreover, the prices of railway tickets, theatres, and tobacco, are reduced to him in any part of France at any time. Thus, though his pay is much less, he is clothed for nothing, fed—if anything—better, housed as well, and may be said to be, except in the matter of canteen, recreation rooms, etc., as well off as his British comrades.

After the stables we passed to the block on the west side, which houses two squadrons. Here we saw a considerable advance on the system in vogue with us, of feeding in the barrack-room. Dining-rooms for half troops were provided, in which a comfortable meal is laid on bare tables, and thus all the disadvantages of dining in the sleeping-room are obviated. The walls of these dining-rooms, which are of stone, were painted in panels with pictures of troopers and officers of Cuirassiers. In one room a map of the surrounding country, drawn on a large scale of say one foot to the mile, had been painted. This had been enlarged by the process of squares, from the official map, and was the work of a corporal in the regiment. The men's barrack-rooms are very clean and tidy. All their clothes are made into a rectangular heap on a shelf at the bed-head, this is surrounded by the great-coat, and the cuirass and helmet are placed—the latter on top of the former—on another shelf. The carbines are in racks at the ends of the rooms. Each room contains from twelve to sixteen men. A stove keeps it well warmed. The system of lighting is by oil lamps in the rooms and gas in the riding-schools, stables, etc. The cuirass weighs about 14 lbs.; the sabre, which is very long, is almost straight, and made for thrust only. The French cavalry scarcely cut at all; they say, and it seems wise, that the cut opens the whole body to attack, whilst the thrust covers it, and moreover gives a much deadlier wound. The sergeants

had small rooms off the men's, which were comfortably got up. The squadron storeroom is looked after by the captain-squadron-leader and his squadron sergeant-major was busy with his charge when we entered it. This storeroom contains everything necessary, and boots for issue on active service, which have already been worn so as not to hurt the feet. As articles of clothing and necessities are issued by the captain from this store, he applies to the *capitaine d'habillement*, who in a measure fills the place of our quartermaster, for new articles from the regimental store; but the total care of the clothing of the squadron is in the captain's hands. The lavatories are all well arranged. I saw no baths. There are inside arrangements, open by night only, for necessary purposes. All is very clean.

From here we went to the squadron riding-school. In it we found a squad of recruits drilling under their captain. The men were very stout, fine fellows. Under the system of universal service every Frenchman of twenty years of age must draw lots for service. If he obtains a good number he is drawn for home service; if a bad one, *i. e.*, a low one, he may be sent to the Colonies, which he much dislikes. His birth-certificate must be produced, and he joins the regiment in his twenty-first year. Thus in the French army, though the men may be smaller as a rule than in ours, one sees no immature boys. The biggest men are drafted into the artillery, the next biggest into the heavy cavalry. In the 9th Cuirassiers the men are very fine. They compare well in size with our heavy Dragoons, or Dragoon Guards, except the Scots Greys perhaps, who are very big men. Their average weight in the saddle, allowing one stone for the cuirass, being twenty-two stone, shows that they are big solid fellows. The recruits had only been two months at work. They vaulted out of their saddles to the ground and back, at the trot and canter, circled right and left, and went over the bar at the top hole but one. All was well done. It was a great pleasure to be able to sincerely congratulate the captain on the result of his labors. The horses jumped well and were in good condition. The colonel afterwards showed me the veterinary department, forge, sick horse hospital, and hospital. We entered the fencing-room, where lessons were going on. All the soldiers sprang up smartly to attention, and were most soldier-like in their bearing. In the street the French *piou-piou*, or Thomas Atkins, is not so smart as we would like to see him, but in barracks all is very different. There is no reason to imagine that the other twelve regiments of Cuirassiers in the French army are behind the 9th in physique and smartness, but I venture to express my belief that they are not superior to this gallant corps.

I was informed that the daily routine of work is as follows: At five o'clock, or four in summer, the orderly-trumpeter sounds the "*Diane*," and a moment afterwards bustle succeeds silence, men rise, open windows and doors, and rush to water and give a bite to their horses. At six o'clock, the sergeants and corporals begin a lecture for three-quarters

of an hour to the men of the squadron. The details of this lecture have been worked out and given to them by the captain-squadron-leader. Next come a few minutes repose, during which a cup of coffee and a bit of bread may be swallowed. After this commences the more serious work of the day, the handling and use of sabre and carbine. Then stables and indoor *manège* as soon as it is broad daylight. At 8 A. M. a few minutes repose. The men now change into stable dress, the linen suits in which rough and gymnastic work is done, and they have a chance now to nibble a bit of bread, which seems never to come amiss to the French recruit.

Now come gymnastics, riding-school, sword exercise, heads and posts, learning to mount and dismount, etc., etc., until eleven. Then *déjeuner*, with soup, meat and, vegetables; for this one hour is allowed. Then out go pipes and cigarettes and off start the men for more riding-school, or, if the weather be fine, open *manège* work. Then heads and posts, teaching the horse to work alone and away from the squadron, work by quarter and half squadrons, in which all the younger officers take part. Here the whistle is constantly used as signal, it being recognized that in the future, in action, working by word of command will be so difficult as to be almost impossible. I think I am correct in stating that in the French army only is there a regular code of whistle-calls in the cavalry, which calls are intended to entirely replace the voice on service. This innovation may turn out to be of great practical value. Then, as a finish, the jumps, two hurdles and a water-jump, which are the special pride of the captain of the squadron, and which he sees are kept to the necessary height and width. These at the last, as the horse knows he is going back to stables, and takes to his jumps more kindly on that account. Three days a week this barrack routine is varied by instruction in advanced guards and topographical work of an elementary nature. All this instruction is given in the open country, always by the captain-squadron-leader, and is carried on from *déjeuner* (or dinner) to afternoon stable hour. When it is considered that the cavalry recruit comes up on the 15th of November (all come up together under the obligatory system and not by twos and threes as with us); that by the 1st of April he must be, according to the last decree of the Minister of War, mobilizable, or fit to take his place in the squadron; when we remember that this gives about eighty working days, deducting Sundays, fête days, etc., in which to work him up to this standard; we must allow that the task before the French cavalry officers and sergeant-instructors is a hard one indeed. An immense amount of practical work has been done since 1870, and the French cavalry of to-day is far better organized and taught than then, if not so well dressed. There will in the next war be no lagging behind for want of proper mobilization, nor want of necessities, nor of proper scouting or intelligence work. Verily our neighbors may say, "Cette fois on ne nous mangera pas tous crus."

The list of officers in a French cavalry regiment is as follows :

1 Colonel.		1 Assistant Surgeon-Major.
1 Lieutenant-Colonel.		1 Veterinary Surgeon, 1st class.
1 Major.		1 Veterinary Surgeon, 2d class.
2 Majors, or Chefs d'Escadrons.		1 Assistant Veterinary Surgeon.
1 Captain Instructor.		—
1 Captain Treasurer (Paymaster).	1st squadron.	1 Captain-Squadron-Leader.
1 Captain Clothier (say Quartermaster).		1 First Captain.
1 Lieutenant Treasurer.		1 First Lieutenant.
1 Lieutenant Standard-bearer.		1 Lieutenant.
1 Surgeon-Major.		2 Second Lieutenants.

The 2d, 3d, 4th and 5th squadrons have the same effective, *i. e.*, six officers each. All six officers of the 5th squadron remain behind in active service time, and so do one or two of the regimental staff. Total 45 officers.

An idea as to how the 9th Cuirassiers have behaved in front of the enemy, may be gathered from the following extracts from its history. At Wagram, on the 5th and 6th July, 1809, it lost 6 officers wounded, 31 Cuirassiers killed, 55 Cuirassiers wounded, 154 horses (of which 17 officers' horses) killed, 102 horses wounded. It almost destroyed the Hungarian battalion Georgy in a charge. At Eckmühl it suffered severely. At La Moskowa it repeatedly charged the Russians, and with the 2d and 3d Cuirassiers, cleared the ground between the two great redoubts; it lost 3 officers killed, 12 Cuirassiers killed and many wounded. At Fleurus (Ligny), 16th June, 1815, the 9th Cuirassiers, with the 5th, 6th, and 10th Cuirassiers, cut the Prussian line in two. On this day Cuirassier Lami took the regimental color of the 69th British regiment, near Quatre-Bras. At Hohenlinden and Austerlitz, its losses do not seem to have been recorded. Any one who sees the 9th Cuirassiers now will certainly be of opinion that its representatives of to-day are not likely to be behind their predecessors in gallant or chivalrous deeds; and whoever may be opposed to them will probably have a very lively time of it with this most formidable and distinguished regiment of Cuirassiers. It only remains for me to thank Colonel Delannoy for his courtesy and kindness in allowing me such a favorable opportunity for making this incomplete report upon the discipline, interior economy, and general bearing of his splendid regiment.

## ALDERSHOT TRAINING IN 1897.

(*The Army and Navy Gazette.*)

**G**EN. H. R. H., the Duke of Connaught, has issued an important memorandum on the training of the troops under his command at Aldershot during 1897. The memorandum says :—

1. In issuing the scheme of field training for 1898 I invite attention to the following points which presented themselves to me during the training of 1897 and which require consideration during the forthcoming drill season :—

### PRELIMINARY INSTRUCTION OF NON-COMMISSIONED OFFICERS OF INFANTRY.

2. Proficiency in field-sketching formed the principal object of the instruction, and the more important subjects (a) to (g), para. 2, sec. 219 Infantry Drill, were in consequence neglected. I have also noticed a tendency in the same direction this winter, and I doubt whether sufficient attention is given to the instruction of non-commissioned officers in map reading, reconnoitring and writing reports, and to their duties in outposts, with advanced guards, and as patrol leaders.

### COMPANY TRAINING.

3. *Individual Instruction of the Soldier.*—In the Instructions for Company Training of 1897 I desired that particular attention should be paid during this period to the individual instruction of the soldier, and to improving his capacity of thinking and acting for himself. This can only be arrived at in the exercise of small bodies under the personal direction of the company commanders, accompanied by explanation and a repetition of the practice when necessary ; I however frequently found four companies of a battalion combined for exercise. The greatest importance must be attached to the intelligent and careful instruction of the men at company training, which is the foundation of battalion and brigade training.

4. *Section Training.*—I attach much importance to the development of section command during company training. In the trained leading of the section lies success in the attack ; with well-trained sections a company can be committed to the densest wood with reliance on their power to make their way, still maintaining direction and cohesion. Progress should be made in this direction.

5. *Company to be Trained as Part of Battalion.*—A company as a rule fights as part of a battalion ; in attack and defense therefore company commanders should regulate their instruction by the consideration that its connection with the battalion, and its functions as part of the battalion in all varying circumstances, should not be lost sight of.

6. *Opposing Forces.*—There was a tendency to exercise companies as opposing forces when the attention of the company commander could not be fully concentrated on the instruction of his men ; as ample opportunities are afforded at Aldershot for thus exercising troops at other periods of the drill season this practice should be restricted, and when carried out a scheme should be set by the commanding officer, or officer second in command, who should act as umpire at the operations.

7. *Ground.*—More attention should be devoted to the instruction of companies in the intelligent occupation of ground, and in taking advantage of the accidents of the country when advancing or retiring.

8. *Outposts.*—In this exercise there was a tendency to overlook the importance of individual tuition. At the practice of outpost duties in company training there should be a broad distinction between individual teaching and tactical training. Two days should be devoted to the former, during which every private should be posted as sentry, the company should be exercised in the rudiments of their duties, and the official instructions should be carefully gone through and explained, without reference to the tactical situation or the employment of the minimum number of men. The third day might be devoted to a system of outposts under a tactical idea in which two or four companies might take part, when no more sentries, patrols, etc., should be employed than would be used under service conditions ; this exercise might be combined with camping, cooking, bivouacs, the construction of latrines, kitchens, shelters, etc.

In regard to the tactical training I noticed the following faults, viz., the sentries were too numerous, they were posted in pairs rather than in groups, and at times kneeling or lying down, there were too many connecting sentries, those over arms were sometimes without their rifles. Patrols moved in too scattered formations ; whilst recognizing the principle that a patrol moving towards an enemy should be preceded by a point, that one retiring from the direction of an enemy should be covered by a point as rear guard, and that a flank exposed to an enemy must be protected ; it is apparent that patrol leaders require instruction in the manner of adapting the various patrol formations. I have seen visiting and communicating patrols moving within their line of sentries with advanced and rear guards and flankers.

9. *Bridging.*—The construction of trestle bridges has not received sufficient attention ; each company should throw a trestle bridge over the canal during its training.

10. *Intrenchments.*—On service, infantry would probably be called upon to construct intrenchments under cover of darkness, and this should therefore be practised during training.

#### BATTALION TRAINING.

11. *Attack.*—Drill in the attack should be constantly practised during battalion training. There are certain points in the principles laid down

in Part V. of the Infantry Drill to which I desire to draw the attention of commanding officers in the training of their battalions.

(a) The increasing difficulty of controlling troops in action by word of command requires greater consideration. All movements should as far as possible be directed by signal (sec. 125, par. 8) ; the more silently an attack is conducted the more orderly will be the advance.

(b) Companies in the firing line when not under fire were prematurely extended. The last two paragraphs on page 134 point out that troops should be kept well in hand and not further extended than is necessary ; in undulating or wooded country extension in the earlier stages is undesirable, the companies to form the firing line and supports should be detached to the front—not necessarily extended—moving in any convenient formation, with such scouts as may be required. If, when a battalion is deployed for attack, the units forming the firing line and supports are detached to the front in compact bodies with such intervals as will be required when their extension becomes necessary, premature expansion which entails loss of control will be avoided. The deployment for attack frequently used by one of the infantry brigades—consisting of two sections per company (of four companies) in compact bodies as firing lines at extended order intervals, followed by the other two sections in support also in compact bodies, whilst the remaining four companies form the reserve—commends itself to me as being handy for manœuvre and readily shaken out into extended order, whilst the small columns have the great advantage of being able to utilize cover. Company commanders should exercise the greatest intelligence in their leading so as to avoid the unnecessary exposure of their men, and the great importance of constantly reforming or reorganizing sections and companies under any chance cover during the advance should not be lost sight of.

(c) The practice of placing entire companies in the firing line supported by other companies should be discountenanced as striking at the independence of the company as a fighting unit (sec. 126, par. 7) ; moreover entire companies extended cannot in war be thoroughly under the control of company commanders.

(d) In the early stages of the attack, when the ground is open, supports, before required to reinforce, are apt to move too close to the firing line, and are thus liable to suffer from artillery fire directed on the firing line ; commanders of supports should fully realize the nature of modern shrapnel fire. Supports and reserves should, however, take advantage of undulating and close country to close up to the firing line, regaining their distances should the country become open.

(e) In order to obtain a superiority of fire the firing line should be made dense as soon as effective range is reached by the early absorption of the supports ; but the regimental reserves should not be absorbed until required to replace casualties or to give impetus to the firing line.

(f) To enable the firing line to push forward at all hazards to within decisive range of that portion of the enemy's position which it is in-

tended to assault, impetus by the accession of fresh troops pressing into the firing line is necessary; this impetus is given by the reserves carrying forward the firing line with them, and each reinforcement should be a signal for fresh advance. This should be practised during the advance by alternate portions; the nearer the firing line arrives to the position attacked the larger should be the advancing units.

(g) Reformation after the delivery of the assault by the second line should invariably follow the assault of a position.

(h) Battalions should be practised as forming part of a larger force both as a central and a flank battalion.

(i) I seldom saw a battalion being exercised as a second line with a skeleton firing line; the importance of this practice is expressed in the last paragraph of sec. 126. par. 13.

12. *Defense*.—The preparation of positions and distribution of the troops in defense was not sufficiently attended to during battalion training; this was manifested in subsequent field operations. Greater attention must be paid to part V., secs. 117 to 120, and 128. The following are the principal faults I noticed:

(a) Insufficient use of intrenchments (screens) as cover for the firing line.

(b) The trace line of the shelter trenches (screens) requires more care and practice in following the configuration of, and in taking advantage of, the accidents of the ground.

(c) The distribution of the first line into firing line, supports, and reserve was frequently not observed; I have seen in the primary distribution entire battalions placed in the firing line without supports or reserves. The importance of retaining the regimental reserves in hand and the danger of employing them too early in an engagement can hardly be overrated (sec. 117, par. 3).

In the selection of a position for defense the extent should be suitable to the strength of the battalion, and careful consideration should be given to any point or points in it which may be of vital importance to its defense. Battalions should be practiced in taking up a certain section of defense in a general scheme.

13. *Outposts*.—The principles laid down in the Infantry Drill are excellent, but the application of these principles is faulty, as on almost every occasion during manœuvres a hostile column has succeeded, under cover of darkness, in piercing the outposts and in establishing itself in a position to render the camp untenable before the commander has been informed of the presence of an enemy. I do not attribute this to an insufficiency of sentries and patrols (these are generally too numerous), but rather to the outpost line not being intelligently occupied, to the situation from the enemy's point of view not being sufficiently considered, and to the want of proper instruction of patrol leaders.

The selection of the outpost line should be carefully considered; main lines of advance of the enemy should be strongly guarded, pickets

and supports being posted on these avenues of approach ; it should be remembered that roads will play as important a part in war as in peace operations ; cyclists should be freely used as " Cossack posts " towards the enemy. The exercises should not be hurried ; the relief of the various portions of the line and the action of outposts if attacked should be practised ; alterations in the dispositions from day to night work should be arranged during the daylight and carried out after dusk. It adds to the interest and instruction of the work when two battalions representing the outposts of opposing forces are posted watching one another.

During battalion training outpost work should be carried on as far as possible on service conditions under tactical ideas. Extra sentries and patrols should not be detailed simply for the purpose of practicing the men ; this should have been done at company training and is false teaching in tactical instruction. It is sounder to consider how weak the outpost line can with safety be made rather than how strong it can be. Every effort should be made to enable infantry to economize its force ; its principal rôle in the field being to fight it should not be unnecessarily harassed by the wearing duties imposed when on outpost.

#### BRIGADE TRAINING.

I have every reason to be satisfied with the manner in which this training was carried out ; there are certain points, however, to which I would direct attention :

14. *Attack.*—(a) In the attack of positions the guiding principle underlying all dispositions, to bring a superiority of force at the decisive point (sec. 107, par. 4) was frequently lost sight of by commanders of units, and has led to isolated and unsupported attacks by portions of the first line on points of the position where it was not the intention of the commander to assault, thus defeating the object he had in view ; without desiring in any way to limit the full development of independent action by company or battalion commanders, their initiative should be subordinate to the general scheme of attack so as to insure that cohesion which is essential ; independent enterprise can seldom lead to any real decision, but rather to a dispersion of the tactical units. If the functions of the three lines were more clearly kept in view, ragged attacks with no superiority of force would not occur so frequently.

(b) The duties of the three lines as laid down in the Infantry Drill were so constantly misconstrued that they are briefly enumerated :

1st Line. To push forward, keeping up a well-directed fire, to within 500 yards (more or less according to the nature of the ground) of the position, and there endeavor to establish itself in a defensive position all along the front, so as to maintain the utmost possible fire effect to prepare the way for the final assault which is carried out by the second line. The success of an infantry attack is dependent on gaining a superiority of fire.

2d Line. To assemble in several lines deep opposite that portion or

portions of the enemy's position selected for assault, and after superiority of fire has been gained by the firing line, to strike the first line carrying the assaulting portions of it forward with them, and pressing forward in successive waves, firing as they go, throw themselves on the enemy's position. For troops to attempt to throw themselves down to fire during the assault would be synonymous with the collapse of the energy of the attack; their action must be to continuously and steadily advance pressing on at all hazards; every halt in the open before an entrenched position at this stage means death to many, the time will be better spent in getting over the ground than deliberately kneeling or lying down to fire at an inadequate target; the assault must be carried through with the utmost resolution and steadiness until the charge with the bayonet. The second line cannot probably be assembled as above described until the attack has developed and the commander is in a position to decide at what point or points in the position he intends to drive home the attack; at first the second line would be in a central position, or with large forces it might be in different parts of the field.

3d Line. To take up a good defensive position in the event of a reverse, and in the event of success to march to the front and take up the pursuit.

(c) In the earlier stages of the attack the second line usually follows too close to the first line (*vide* sec. 124, par. 9).

(d) Reformation after assault should be practiced.

15. *Defense*.—The occupation of defensive positions and the duties of the three lines in defense require practice; defensive positions should be taken up with a view to counter-attack. During field operations I never saw local counter-attacks delivered by the second line or a general offensive assumed by the third line. The defense whose object is to achieve a decisive result must be active, *i. e.*, it must be combined with attack by a bold counterstroke. The duties of the three lines, viz., first line to occupy the front line and to replace casualties in the firing line; second line to reinforce vital points if they are in danger of being captured, to meet flank attacks, and to make local counter-attacks; third line to assume the offensive after the attack has been fully developed, should not be lost sight of.

16. *Outposts*.—The opportunities for practicing outpost work by day and night should be taken full advantage of, and the erection of shelters for pickets and supports should not be neglected; I have commented at some length on the points to which I have considered it necessary to draw attention under "Company" and "Battalion Training."

17. *Wood Fighting*.—The wooded country at Woolmer and Barrosa affords opportunities in the exercise of troop-leading through woods and wood fighting which should not be lost sight of; the importance of reforming troops before emerging from woods under an enemy's fire should be insisted on.

## FIELD OPERATIONS.

The remarks published contain my comments on the operations, but I republish certain portions to which I attach importance.

18. Commanders of sides were too apt to anticipate an engagement on a certain portion of government ground, and to make their primary dispositions accordingly, when there was nothing in the information given in the Special Idea which should have led them to believe that an action was imminent; this was particularly noticeable on July 26 and August 6. Such arrangements give an unreality to the operations which should be avoided.

19. *Attack.*—I have already alluded to the practice of prematurely extending for attack. On one occasion I noticed troops extend before there was any indication of the presence of an enemy; it was afterwards found that he was not in position at all. This unnecessary extension of troops when well out of the sphere of action tends to exhaust the men, and may result in the loss of valuable time. Deployment for attack may be necessary at a considerable distance from the position; extension should not take place until under fire. The mistake was occasionally made of unduly launching the infantry (1) before proper reconnaissance of the enemy's position had taken place, (2) before superiority of artillery fire had been obtained, and (3) before the necessary deployment had been completed—units therefore did not clearly understand their commander's plan of attack, their objective, limit of front, or the part they should play in carrying out the attack. The preliminary stages of the attack should not be unduly hurried, nor should the attack be launched until the position has been prepared by artillery fire and the orders referred to in Infantry Drill, sec. 112, have been issued and thoroughly understood. I was glad to observe a more frequent introduction of flank attacks, but greater accuracy is necessary in timing these attacks in order to prevent the liability of the force being beaten in detail. It should be considered, however, that wide turning movements necessitate a division of strength, especially dangerous with small forces, and that attending them there is a risk of laying open lines of communication.

20. *Defense.*—There has been a tendency to occupy with infantry positions in advance of the main line of defense; attention is invited to Infantry Drill, sec. 117, par. 9. With modern arms the difficulty of withdrawing infantry engaged has so greatly increased that it would be attended by considerable loss, and the troops would be unable to take part in the main defense; these points require consideration in the arranging for the general distribution of the infantry. I do not here refer to the outposts which cover every force in the presence of an enemy. Positions occupied were in most instances larger in extent than were suitable to the strength of the force. Reserves were not kept in hand for counter-attack; mistakes on the part of the attacking force should not be permitted to go unpunished, and with quick decision an adversary's blunders should be turned to profit by vigorous counter-stroke; defen-

sive positions were, however, seldom taken up and held with this end in view.

21. *Retirements.*—I was not satisfied with the manner in which retirements were conducted during the field operations. They should be effected by alternate portions affording each other mutual support (Infantry Drill, sec. 121, par. 2). Short retirements are unreal; troops cannot withdraw from touch with the enemy in echelon of companies halting every fifty yards. A retreat should be directed from the rear and positions occupied to protect the movement (sec. 127, par. 6). There is no more difficult operation in war than retirement in the face of a victorious enemy, and it requires constant practice during battalion and brigade training. Forces when withdrawing before an opposing force, generally got compromised by delaying too long before commencing the retirement; this was noticeable on August 23 and 24. There was also a tendency in rear-guard actions to hold on too long to the successive positions taken up; this was especially noticed at the operations on August 19 and 23.

22. *Cavalry.*—The information given by reconnoitring cavalry to commanders of forces was on some occasions good, but at others it was meagre and misleading, and on August 19th it was false, which led to the withdrawal of a force from the position it had occupied; all important information should be verified. The dependence of a commander on his cavalry for information cannot be too strongly impressed on squadron leaders. Reports were frequently received without the time and place of despatch being entered, which rendered them valueless; they were sometimes not signed. Cavalry orderlies should be instructed as to the probable whereabouts of the officer to whom the report is addressed; the officer commanding a force should inform the officer commanding his reconnoitring cavalry of his position, and on quitting it a staff officer should remain to receive messages and forward them to him. After the reconnaissance cavalry did not concentrate with sufficient rapidity for subsequent action in conjunction with other arms. Repeated charges at short intervals of time were frequently made; this should be checked.

23. *Artillery.*—Instances occurred of artillery having been ordered into unsuitable positions, and guns were pushed to the front without support or escort owing to commanders of forces having failed to consult their artillery advisers. Changes of position at short distances were noticed. Guns were occasionally lost in consequence of a want of mutual support between the three arms. Infantry and cavalry are not sufficiently jealous of their artillery; the increased losses of artillery through musket fire demand that that arm should be afforded ample protection. Should artillery commanders find themselves without escort they should, if necessary, demand assistance from the nearest troops (Field Artillery Drill, page 26).

24. *Escorts to Guns.*—I had on several occasions to find serious fault with the manner in which infantry escorts were posted; occasionally

they were placed immediately in rear of the guns, and frequently in line with them. It is the duty of escorts to keep the enemy's infantry at least 800 yards from the guns (Field Artillery Drill, page 26); this cannot be successfully accomplished unless the escort is placed in echelon on the exposed flank, scouts or sentries being posted to prevent the possibility of the guns being surprised. An entire escort should very seldom be scattered by being extended; a portion might be extended with a support and perhaps a reserve. The position of the escort will depend mainly on the nature of the ground, and in making his dispositions the commander should recognize his responsibility to protect the artillery from the enemy's infantry fire.

25. *Infantry*.—Flanking patrols to lines of infantry moving to the attack were too close to the flanks to prevent surprise. Firing lines were not kept at their proper density by the infusion of fresh troops. There were many failures in regard to the reforming of troops after a local position had been carried and when opposition had ceased previous to a further advance.

26. *Machine Guns*.—Insufficient attention was paid to the employment of machine guns. During operations they were frequently handled in a reckless manner, being pushed forward under heavy fire to closest range when they should have been employed on a flank. Greater attention should be paid to Infantry Drill, sec. 114, par. 3; and sec. 117, par. 5, and I trust that general officers commanding infantry brigades will give this matter their consideration during brigade training.

27. *Medical Units*.—Commanders of forces did not in every instance fully appreciate their responsibilities in connection with the tactical arrangements necessary when accompanied by bearer companies and a field hospital, and medical officers in charge were not informed of commanders' intentions.

28. *Umpires*.—Umpires were inclined to favor the attack in giving their decisions, thus increasing the difficulties of the defense; the absence of reserves and the extent of the position occupied being in excess of that which the force available could hold may have influenced their decisions; the rules contained in Infantry Drill, sec. 211, par. 5 should, however, be adhered to. Opposing forces were allowed to approach too near each other without the red flag being brought into use.

29. The principles laid down in the drill books should be strictly adhered to not only during the various trainings, but also at the subsequent operations and manœuvres.

30. Infantry were very frequently ordered to parade for operations, etc., at an unnecessarily early hour; no battalion should fall in more than 20 minutes before the hour at which the brigade moves off. At field operations units should not reach the place of assembly before the hour named in the orders for the assembly of the troops.

ARTHUR, General Commanding District.

Aldershot, January 1.

## NOTES ON ARTILLERY DICTATED BY NAPOLEON AT ST. HELENA TO BARON GOURGAUD.

By F. E. B. L.

(From Proceedings of the Royal Artillery Institution.)

These notes, here given in their original form, have been communicated to the *Revue d'Artillerie* by Viscount de Grouchy who has drawn them from among his family papers.

It would be superfluous to insist on their historical interest.

Taken from dictation with a view to ultimate editing and publication, which however never came to pass, the notes are free from the adornments of style which usually characterize a work meant for the public, and indeed their extreme conciseness detracts somewhat from their clearness. Notwithstanding this the Director of the *Revue* has respectfully preserved the original form, for fear of altering the sense.

THE unit of artillery is the division (battery): for horse artillery 6 guns; for field 8. The officers, N.-C.O.'s and gunners of a company are sufficient for its service.

It would be better, were it not determined otherwise by the details of artillery, to form a unit of 4 guns, because a battery of 8 guns is already too numerous not to be often divided; but what forces the adoption of the larger unit is on account of artificers, spare stores, forges, etc. In taking a unit of 4 guns all that would be doubled; the extra expense involved would not be compensated by the advantage attaching to the 4-gun unit.

\* \* \* \* \*

The 4 prs. and the 8 prs. have been rightly suppressed. Gribbeauval simplified and experience has proved the necessity of further simplification. We have progressed in that direction. The 8 prs. and the 4 prs. were often employed in the wrong place: the ammunition of 8 prs. was expended where that of 4 prs. would have sufficed. It was a very considerable loss if transport is considered, it was 2 rounds instead of 1. Often there were only 4 prs. when 8 prs. were required. There is no line officer, nor even artillery officer, who can well grasp the opportune moment and determine if 8 or 4 prs. should be employed, and even if he could, he is obliged to utilize what he has at hand. A single calibre is therefore sufficient for field work, then there can be no uncertainty.

The 12 pr. in either system remains in reserve to be employed with premeditation by general officers, either of the line or of the artillery.

The 6-in. howitzer is too wasteful; it consumes as much as a 24 pr. shot. They have rightly replaced it by a howitzer of 5 inches 6 lines; this slight difference of 6 lines gives a great advantage. The wagon holds 75 rounds, whilst that of the 6-in. only holds 50, and in supposing

that the 5½-in. shell be inferior to the 6-in. the question comes to this: which would you rather have, one 6-in. howitzer or two 5½-in. ones. But the 5½-in. shell is already preferable to the 6-in. one. Gribeauval's carriage was altogether faulty. It has been altered, and rightly so, for there has been a gain of 100 per cent. in transport, and lightness given to both the carriage and the howitzer. But the latter still requires improvement: it should have a greater range, which might be obtained by lengthening it.

There should be two sorts of howitzers, one to combine with the 6 prs., the other with the 12 prs. The latter must have the inconvenience of greater weight, so as to obtain the greatest possible range from the form of the chamber, length, thickness of metal, etc. All these drawbacks are amply compensated in a reserve howitzer by the range being increased to the utmost. The field howitzers of the Boulogne Camp had that advantage.

It is equally necessary that the existing 12 prs. should have an increased range, not that changes in the gun are necessary, but in the carriage, which should admit of greater elevation being given to the gun.

Parks should also have 12 pr. grenades (see note C) which would weigh \* \* \* to be used with the 12 prs. Every wagon should contain some of these grenades in place of common shell.

This is contrary to Gribeauval's principle, which however is false. There are a thousand circumstances in war where it is requisite to open fire at a very long range, whether from one bank to the other of a wide river, or to hinder the enemy from encamping and occupying a position which can only be attacked from a distance. Finally it is a real disadvantage not to reply to an enemy's fire. We look, however, to artillery officers not to fire uselessly, for we pretend in no way to attack the fundamental principle that to open fire at a long range under ordinary circumstances is to burn ammunition and to destroy its effect.

Guns of higher calibre than 12 prs. are very useless. We have acted wisely in suppressing the 16 pr. which the Prussians and Austrians still drag about.

\* \* \* \* \*

Artillery officers have differed in opinion as to whether the 8 guns with their limbers should march past, the wagons following behind the 8th gun, or whether each wagon should follow its gun.

Theory and the old orders demand that the 8 guns should be first, in order to come into action with the utmost rapidity after passing a defile, so as to open fire and extinguish that of the enemy; before the limbers are empty the wagons come and take their place. Successive fire after the passage of a defile may indeed allow the enemy to dismount the first guns, and give him for the moment a superiority which may cause the loss of many men.

In general, artillery officers prefer that the wagons should follow the

gun. They fear the wagon may make a mistake and get lost amid the perplexities and circumstances of a battle. They feel the want of obtaining every possible security that the wagon shall not be far from its gun, and they can find no other means than by keeping the wagon always under the eye of the No. 1 of the gun.

A limber, containing but 15 rounds of 6 pr. and 6 rounds of shell, is a very slight provision.

It is thought that the wagons of a battery should follow the guns, to obviate the inconvenience of successive fire on issuing from a defile.

Two pack-mules, carrying 2 boxes of 12 pr. ammunition or 15 rounds of 6 pr. each, or \* \* \* of shells, could follow a gun without being in the way or retarding the movement of the other guns. Every 6 pr. would thus find itself with 60 rounds including the contents of its limber, before the arrival of the wagon.

The advantages of two pack-mules per gun or howitzer are numerous. The supply of the 6 pr. can thus be carried to 200 rounds, and that with a single wagon. The wagon might keep out of fire, lessen the number of accidents which throw disorder into a battery, and save the lives of many men and horses. As every mule carries 24 rounds, these would be the first source of supply, and the limber would remain untouched, as it should be, for the moment of retreat or as a last resource. The fire-worker would take the ammunition from a mule within reach of the gun, but out of the line of fire; the other mule would be further in rear. These mules might pass to and fro, deposit their boxes and go to the wagon for new ones, an arrangement which would require that the shells should be carried ready fused in the wagons. It would be an advantage for the artillery and for the army to keep the wagons far from the enemy's fire, in ditches, ravines or defiles, which would cause an army to be much lighter in its movements and upon the field of battle. The disadvantage would be inappreciable in retreat, since as soon as its boxes were empty the wagon might commence its retreat four or five hours before the end of the day.

Every division (battery) should also have 4 pack-horses or mules loaded with infantry ammunition, so as to be able to supply the skirmishers without having recourse to the wagons. The places where the most infantry ammunition will be consumed will be woods, and hillocks where wagons could not get and where pack-animals are of very great service.

Often even on plains the wagon meets with many difficulties: it cannot move because the ground is too soft, and when after much effort the gunners get their pieces into action, it is advantageous not to tire the wagon horses. The more one sees of war the more one understands the utility of having a fourth of the ammunition supply carried on a mule's back.

The 24 prs. weigh nearly 6000 pounds; it is sometimes difficult to bring them into action under fire. The idea which has been expressed

of having light 24 prs. is good. If we had had these pieces in Egypt, we should probably have taken some into Syria by land. It was judged impossible to take the existing 24 prs. across the desert of Katieh, and if we had had four of these pieces in front of Acre, the town would have been taken on the first day. A 24 pr. carronade which was taken at Kaiffa from Sidney Smith's longboat was placed in a battery, and its effect was incomparably superior to that of the 12 pr., and yet this carronade cannot be compared for effect with a 24 pr. gun. For all places situated in mountainous regions guns of high calibre are necessary, and in many such a position where a light 24 pr. could be taken it would be almost impossible to take the ordinary 24 pr.

It must not be concluded from this that we should substitute the short 24 pr. for the ordinary one, but the short one should be maintained and improved, and the arsenals should have some to provide for extraordinary circumstances.

It would be wrong to say that we thus complicate the equipments of artillery: it is difference of calibre which causes complication.

The 16 pr. has been rightly suppressed. The 12 pr. is sufficient for ricochet fire, direct fire, and for the defense of places and where the 16 pr. might have some advantages, these are not equal to that of supplying a place with the same ammunition as is issued to troops in the field. It was on this principle that we did well in abolishing the 8-in. howitzer. In the same way places should be adapted for 6 prs., so that artillery should have but 4 calibres, the 6, 12, 24 prs. and the 5½-in. howitzer. In this way we abolish 4 calibres.

We should add 3 prs. for mountain equipment. In abolishing the Rostaing guns, we get rid of stubborn beasts not worth the trouble they give. Three prs. should be a minimum calibre. Some of them are made very light and carry as far as the Rostaing pieces.

\* \* \* \* \*

The 10-in. mortar has been suppressed, and the 8-in. and 12-in. preserved. The 8-in., which throws a 40-pound shell, is an excellent mortar: it is the true siege mortar.

The 6-in. mortars appear necessary, both for the attack and defense of places. These mortars, which do not weigh 100 pounds, have the greatest effect in trenches and covered ways. A field artillery park should have twenty of these which can be used with 5½-in. shell, and may be useful against redoubts and villages and thus save the howitzers, the fire of which is very destructive to their carriages.

The question of the 12-in. and 10-in. mortars is not yet decided. The 12-in. throws a 150-pound shell, the 10-in. only 100 pounds. In this respect the 12-in. is to be preferred. Since we have an 8-in. it is useful to have one with far more power, but M. de Gribeauval had abolished the 12-in. and adopted the 10-in., because he thought that the calibre of 8 or 9 inches was the best for long ranges. The mortars which were cast at Cadiz had less than 9 inches.

More experiments are still required, and if they confirm the old ones to the effect that the longest ranges are obtainable between 8 and 9 inches, we should then abolish the 8-in. and substitute for them the new calibre. Of course the mortar should have a cylindrical Gomer chamber and the lightest possible for short ranges and beds for long ones.

We should have thus 3 mortars: the 5½-in., the new model between 8-in. and 9-in., and the 12-in.

A mortar shell of the new model would not weigh more than 60 lbs. That is not a sufficient weight and would cause one to feel the want of the effect of a 12-in. shell.

Long-ranging mortars are only useful at particular points of the coast or in places destined to defend a particular point, for the fire is so uncertain, long and difficult that it can be of no use at ordinary times. It was on the occasion of the bombardment of Cadiz that mortars were cast at Seville with a range of 3000 fathoms. The coasts of Flushing, Ile d'Aix and Hyères were armed with these. These mortars, joined to the special carriages which were given to the coast guns to enable them to fire at 45°, were a sufficient defense to drive off the English whenever they attempted to cast anchor in Hyères roads.

\* \* \* \* \*

Field batteries comprise 2 howitzers per battery, which makes one-fourth for them and one-third for horse artillery. An equipment of 40 batteries gives 80 howitzers. This has been blamed, but wrongly so. The 5½-m. howitzer is not more expensive than an 8 pr. and this large number of howitzers is necessary to dislodge the enemy from villages, to shatter redoubts, etc. Frederick the Great [called Frédéric II. by Napoleon] was the first to augment the number of howitzers.

If a calculation be made of the equipment of field artillery, according to the proportions which have been adopted in the late wars of 6 and 12 prs. and 5½-in. howitzers, a great economy will be found when comparing it with an equipment of an equal number of pieces on Gribeauval's system.

\* \* \* \* \*

A battery with six 6 prs. and two 5½-in. howitzers would have in carriages: 8 gun carriages, 2 spare ones, 1 forge, 1 prolong,\* 6 wagons with 6 and 12 mules, 4 wagons with shell and 4 mules; total: 23 carriages, 121 horses, 1541 rounds and the mules (see note D).

We should have a wagon and a half per 6 pr., which would make: 26 carriages, 130 horses, 1576 rounds.

There are thus 3 carriages, 9 horses and 102 6 pr. rounds more, but 66 fewer howitzer rounds.

The 6 pr. with pack-mules would have 196 rounds in the first case or 211 in the second; the howitzer 188 or 155.

The double supply would give under the first hypothesis 6 carriages

\* See note lower down.

more for the 6 prs. and 3 for the howitzers, total 9, which would bring the number of carriages to 31 and the number of rounds to 324 per gun and 300 per howitzer.

Under the second hypothesis the double supply would require 9 gun wagons and 4 howitzer wagons, making 13 wagons and would bring the number of carriages to 39. Difference in the wagons in addition under the second hypothesis: 11.

There would be 406 rounds per gun, and 310 per howitzer.

The second hypothesis gives them 476 rounds, but employs 11 carriages and 64 horses more; now these 64 horses might be replaced by pack-mules with 1500 rounds, but the proportion of 324 for 6 pr. and 300 for howitzer is sufficient and forms exactly a double supply.

In comparing a 12 pr. under the mule hypothesis we find 136 rounds in wagon, 10 in limber and two mules with 12 each, total, 170 rounds; difference, 44 rounds or 3 horses.

In the double supply let us add 2 wagons and we shall have 306 rounds. Under the second hypothesis there would be 6 wagons, which would make 405 rounds. In drawing up a scale, put pack-mules, double supply: 5 mules (3 in front line, 2 in the second at the park) and of the 3 remaining, 2 with the gun, one with the divisional reserve; the 2 of the double supply would be with the general park.

We should count also in each artillery division 2 S. A. A. wagons, so that wherever there is an artillery officer there may be also some cartridges, and I believe also 2 mules carrying 6000 rounds (see note E). A division being supposed to have 3 batteries that would give the value of 7 wagons or 108,000 rounds; as the division is supposed to consist of 12 battalions with 36 mules or 108,000 cartridges, it would thus have 216,000 rounds which would give 27 rounds a man to 8000 infantry.

We will suppose the army up to full strength. The company has 136 men; take away 3 officers, 2 drummers, 2 pioneers, 1 musician, there remain 128. Taking away the fifteenth part for the difference between full strength and the number present, we get 120 present; this, for six companies, makes 720 muskets. In subtracting only the fifteenth we suppose the commencement of the campaign, for, after a few engagements and marches, the difference will be much more considerable.

The 3 battalion-mules will carry 9000 rounds or 12 per man. In adding to the divisional supply half a wagon per battalion we should have 7500 rounds or 10 per man; in adding half a pack-mule we shall still have 2 rounds a man, total 24, which for a division of 12 battalions demands 12 wagons and 6 mules, of which half for each battery reserve, and half for the divisional park.

A half wagon, or 11 rounds per man, will be with the park of the army corps; a half mule per battalion with the same park (which gives 2 rounds a man): so that the division will possess there 12 wagons and 6 mules.

A half wagon and a half mule with the army park: altogether 13

(11 + 2) rounds per man. A half wagon or 22 rounds on requisitioned carriages or in a depot within the enceinte of the army, at one or two days' march. This ammunition will be in boxes. Another estimate of a half wagon in boxes, but not on carriages. Thus each battalion will have :—

A wagon and a half and 6 mules in service order with the corps, with the division, or at the army corps park and at the general park.

One wagon load in boxes within reach of the army.

That will make 40,000 rounds on wagons and pack-mules in front line, 15,000 at a depot. The 40,000 movable rounds give from 40 to 50 per man; the 15,000 depot rounds give 20 to 25; total, 70 to 75 rounds a man with the army, 25 rounds at a depot in the second line, at less than 5 marches from the army.

A battalion will thus have 6 mules, of which 3 present with it and 3 with the artillery, and 2 wagons, of which one and a half would be horsed.

A division of 12 battalions will have 6 wagons and 6 mules with it; the same at the army corps park; and the same at the general park of the army. Total 18 wagons and 18 mules, and besides there will be 36 mules with the battalions and belonging to them. That will make 270,000 rounds horsed, 18,000 on park mules, 36,000 on the battalion mules, total, 324,000, which for 8000 infantry gives 40 rounds a man, and the value of 24 wagons at the rear of the army, at less than 5 days' march.

We must put then on these carriages 2 wagons per battalion. Suppose 80,000 infantry, or 100 battalions, we should require 200 S.A.A. wagons, of which only 150 horsed, which would only need 750 horses, without counting rejected ones, and 180 pack-mules, and 360 belonging to the corps. That makes 1400 horses to carry the cartridges, which appears to be the mean.

#### EXPLANATIONS.

The following explanations are from the pen of Captain de Reviers de Mauny, a recognized authority on the history of artillery.

##### NOTE A. ON THE COMPOSITION OF THE ARTILLERY MATERIAL.

Since the second half of the 16th century the French artillery have only used guns firing shot at 4, 8, 12, 24 or 32 lbs. The drawings of these guns, fixed for the first time in 1668, were modified by the order of the 7th October, 1732, which only preserved the 5 first calibres.\* Then, after the Seven Years' War and after a series of comparative trials carried out by Gribeauval, at Strasbourg, in 1764, the War Minister decided (19th December, 1764) that the only guns which in future should accompany an army in the field should be 12, 8 and 4 prs. and a few 6-

\* Captain de Mauny omits to state wherein the modification lay. According to the preceding paragraph there were only 5 calibres in 1668.—F. E. B. L.

in. howitzers of a new construction. The other guns were reserved for sieges and for the armament of fortified places. Also tables of dimensions determined and made uniform for the whole kingdom the mode of construction of gun and other carriages.

In 1774 it was ordered that the arsenals should contain always ready all that was necessary to form 8 field equipments and 3 complete siege equipments. This material was in existence in 1792 when war broke out; it was soon found to be insufficient and, notwithstanding the somewhat irregular activity which covered the national territory with factories, foundries and improvised arsenals, the French armies depended on prizes taken from the enemy as their principal resource. Thus the army which crossed the Alps in April, 1796, only possessed 30 guns; a few months later it had nearly 1200, of which 600 were field pieces. Now the calibres used in foreign armies, other than the Spanish army, were 3, 6 and 12 prs.; the French 4 and 8 prs. could not therefore utilize the ammunition found in conquered places. Also, peace concluded, a commission of artillery officers was ordered to study the improvements of which Gribeauval's material was susceptible. Under the energetic impulse of the First Consul and thanks to the activity of General Marmont, then President of the Artillery Committee, the work of this Commission ended in the adoption in year XI. of a much simplified material, the construction of which began forthwith. There were to be only 3 calibres, 6, 12 and 24 prs.; all the others were relegated to the service of the defense of places. The short and the long 24 pr. were allocated to siege work; the 24 pr. (5½-in.) howitzer, the 6 and 12 pr. guns should alone accompany armies in the field.

In consequence of circumstances, both complex and numerous, the new material was only partially sent on service during the campaigns in Austria, Prussia and Poland; it was only for the campaigns in Russia (1812) and in Germany (1813) that the Grand Army could be completely provided with the material of which the Emperor here speaks, and which was almost entirely lost. In 1814 they had to glean all that remained in the national stores: the 8 pr. and 4 pr. reappeared and were finally retained in the service—chiefly for reasons of national economy.

#### NOTE B. ON THE ORIGIN OF HOWITZERS.

The idea of placing on a wheeled carriage a short piece firing almost horizontally hollow bombs or projectiles appears to have had its birth in England or in Holland. The piece received the name of "howitzer, haubitze, obus." It had been adopted by nearly all European armies before the French paid them any attention, although they had taken two of them at the battle of Fleurus. In 1740 Field Marshal de Belle-Isle, then Governor of Metz, caused experiments to be made with this invention which had been presented to him as absolutely new. For the campaign in Bohemia, Bavaria supplied the French army with some of these pieces. They served as models for those which were constructed

at Douay in 1743. and after that howitzers regularly formed a part of all field artillery equipments.

NOTE C. ON THE MEANING OF THE WORD, "GRENADE."

By this word Napoleon doubtless meant "shrapnel," invented by the general of that name, and which had been in use in England since 1803.

An English howitzer and two wagons filled with these shell having been taken at the battle of Albuera (16th May, 1811), the Emperor ordered General Elbé,\* the *ad interim* President of the Committee (letter of the 22d Aug., 1811), to have experiments carried out to determine the mode of loading these shell. Thenceforth Napoleon attached great importance to their property of bursting on graze and projecting their contents as far as possible.

NOTE D. ON THE ARITHMETIC OF THE PENULTIMATE PARAGRAPH.

The Emperor calculated mentally with extreme rapidity, but often rounded off his numbers. Besides, he dictated very quickly, and the writer, in making his fair copy, had to verify the figures, which he had often had great difficulty in catching.

The Emperor seems to have taken the following data :

6 pr.: wagon 130 rounds; gun limber 15; mule 24  
Howitzer: " 75 " ; " 5; " 14

Guns had normally 6 horses, other carriages, some 6, some 4. To facilitate his calculations Napoleon counted 5 horses per carriage (see *Correspondance Militaire*, Vol. X., p. 319).

That being granted, the figures of the penultimate paragraph should, it would appear, be read as follows :

A battery of six 6 prs. and two 5½-in. howitzers (with ordinary supply) would have 23 carriages (without the prolong †), 115 horses, 1544 rounds, and 16 mules.

We must now put a wagon and a half per 6 pr. (total 9 wagons) which would make 26 carriages, 130 horses and 1590 rounds. There are therefore 3 carriages, 15 horses and 102 6 pr. rounds more, but 16 mules and 56 howitzer rounds less.

The 6 pr. with ammunition mules would have 196 rounds ( $1173 \div 6$ ),

\* They tell a good story of Elbé. He was a horse artillery captain at the outbreak of the Revolution and his men were a rough and insubordinate lot. One day he told a gunner to dismount. The man wouldn't, but replied: "La république m'a fait un cheval pour que je monte dessus." Elbé replied: "Elle t'a aussi fait un capitaine pour que tu lui obéisses." And Elbé pulled him off his horse.—F. E. B. L.

† Captain Rollin, the Commandant's deputy in the service of the *Revue d'Artillerie* informs me that the name "prolongue" in Napoleon's time was occasionally given to the divisional ammunition wagon. The word does not belong to the existing nomenclature of artillery material, but is often used colloquially to designate certain old fashioned wagons now only used for fatigue duties. These wagons are like the service forage wagons except that they have closed instead of open sides. Neither of these meanings of "prolongue" is given in Littré.—F. E. B. L.

and under the second hypothesis, 212 ( $1275 \div 6$ ). The howitzer in the first case 185 ( $371 \div 2$ ), and in the second case 157 ( $315 \div 2$ ).

To have the double supply we require under the first hypothesis 6 carriages more for the 6 prs. and 3 for the howitzers, total 9, which brings the total number of carriages to 32 and the number of rounds

per 6 pr. to  $196 + 130$ , or 326 and per howitzer to  $185 + \frac{3 \times 75}{2}$ , say 307.

Under the second hypothesis a double supply would demand 9 gun and 4 howitzer wagons more, 13 in all, bringing the total of carriages to 39. The total number of battery wagons would be 26 under the second hypothesis, and 19 under the first—a difference of seven wagons. The number of 6 pr. rounds would be  $212 + 130 + \frac{130}{2} = 407$ , and of howitzer

$$157 + \frac{4 \times 75}{2} = 307.$$

The second hypothesis has therefore an increased total of ( $407 - 326$ )  $6 = 486$  rounds, but employs 7 carriages and 35 horses additional. Now, if these horses were replaced by pack-mules, the latter would carry  $35 \times 23 = 840$  rounds, or a further increase of  $840 - 407 = 433$  rounds. But the proportions obtained under the first hypothesis of 326 for 6 pr. and 307 for howitzer are sufficient and form exactly a double supply.

#### NOTE E. THE CALCULATIONS IN THE LAST PARAGRAPH.

At first sight many of them appear to be erroneous, and it would seem in dictating them the Emperor was following in his mind the development of an hypothesis which he never enunciated, so that it is no easy task to unravel them.

However that may be, the basis of the imperial arithmetic was probably the following:

S. A. A. wagons, about 15,400 rounds, or rather more than 21 per man in a battalion with 720 rank and file.

Mule, 3000 rounds, say 4 rounds per man of the battalion.

With these data the paragraph should apparently be read as follows from the third line:

The 3 battalion mules will carry 9000 rounds—say 12 per man. In putting with the army division a half wagon per battalion, we have 10 rounds per man, and adding half a mule per battalion, *i.e.*, 2 rounds per man, we get 12. The division will then have 24 rounds a man. If it be composed of 12 battalions, that implies, in addition to the 36 battalion mules, 6 wagons and 6 mules which will be placed: 1 wagon and 1 mule in each of the 3 battery reserves, and 3 wagons and 3 mules in the park of the division.

At the park of the army corps there will be per battalion a half wagon and a half mule, or 6 wagons and 6 mules carrying 13 rounds a man.

The same at the park of the army.

A half wagon per battalion, or 11 rounds a man, horsed, on requisitioned carriages.

Thus every battalion will have a wagon and a half, horsed, and  $4\frac{1}{2}$  mules, present with it. \* \* \* that will make 36,000 rounds horsed or on pack-mules, and 15,000 at the reserve depot.

The 36,000 rounds horsed give 50 rounds a man, and the 15,000 give 20, total 70. There will be besides, at depots in the second line and at less than 5 marches in rear, 25 rounds a man.

A battalion will thus have  $4\frac{1}{2}$  mules, of which 3 with it and 3 halves with the artillery, and 2 wagons of which  $1\frac{1}{2}$  horsed. Similarly a division of 12 battalions will have 36 mules with and belonging to the battalions, 6 wagons and 6 mules at the divisional park, the same at the army corps park and the same at the general park. Total, 18 wagons and 18 mules in addition to the 36 battalion mules, or  $(18 \times 15,000) + (18 \times 3000) + (36 \times 3000) = 432,000$  rounds, which gives 50 rounds a man to 8640 rank and file. There would also be at the rear of the army at less than 5 days' march the value of 14 wagons, or about 25 rounds a man.

We see we should have to put on wheels the contents of 2 wagons per battalion (of which one and a half horsed). So any army of 100 battalions would require 200 S.A.A. wagons, of which 150 would be horsed, only requiring therefore 750 horses (without counting lame ones) and 250 pack-mules in addition to the 300 battalion mules. That makes from 1300 to 1400 horses and mules to carry the cartridges, which appears to be the mean.

## “THE GERMAN AND FRENCH MILITARY MAN- ŒUVRES OF 1897”: SOME RETROSPECTIVE DEDUCTIONS.

BY COLONEL E. T. H. HUTTON, C. B., A. D. C. TO THE QUEEN.

(*Papers of the Aldershot Military Society.*)

### INTRODUCTORY REMARKS.

I HAVE no little misgiving in undertaking this afternoon the task of submitting for your consideration and thought some deductions as the result of a visit to the recent German and French Manœuvres.

It is always a pleasure to renew an old acquaintance with the Military Society of Aldershot; but I felt in accepting the proposal made to me on this occasion that I could only very inadequately take the place of one or two officers in high positions at this station who have had almost equal opportunities as myself of learning the great lessons which a visit to our comrades of the German and French armies

undoubtedly provides. I have only undertaken this task upon the understanding that my friend, Colonel Talbot Coke, would supplement my remarks, and that my friend, Lieut.-Colonel Eustace, would also supply some additional facts which his artillery experience has doubtless provided him with.

In the remarks which follow I have not attempted to enter into the detail of the drill, of the equipment, or of the composition of either German or French armies; nor do I propose to weary you with a long and succinct account of the manœuvres in detail. Excellent handbooks are published by the Intelligence Department, with which I shall assume that you are all more or less conversant.

I purpose, however, to endeavor to convey to you the impressions formed in the mind of an onlooker, who has recently taken part in British manœuvres, and who has been concerned in the instruction and in the leading of British troops—Regulars, Militia, and Volunteers—in most parts of the empire, and one, therefore, who is deeply interested in the methods adopted on the Continent.

The best plan will be to give you a few short extracts from a diary, which, together with the comments, was written at the time, and I will from them draw the deductions which, I venture to hope, may provoke some interesting discussion now, and may provide some thoughts worthy of careful reflection hereafter.

It has been my object in preparing this paper and in framing the deductions to suggest ideas which are of importance not only to the Regular army, a relatively small portion only of the military forces of the Queen, but also to that great mass of troops in Britain and Greater Britain, which constitutes the real defense of the British Empire.

#### PART I.—ILLUSTRATIVE INCIDENTS.

The following accounts are extracted verbatim from a diary kept at the time, and are intended to illustrate the deductions which follow:—

I. *Ceremonial Parade* (German).—Review of the XIth Prussian Army Corps, etc.

The parade which took place in the neighborhood of Homburg consisted of the XIth Corps (Von Wittich), comprising 3 divisions, viz., 21st (Perthes), 22d (Von Collas), and 25th (Von Müller), also an improvised cavalry division (Von Bissing), numbering approximately 30,000 men and 4000 cavalry.

“The comfort and the convenience of spectators were most carefully studied. A large and commodious stand was provided for which a moderate charge for seats was asked. Illustrated programmes could be purchased for a very trifling sum, and the roads and paths leading to the parade ground were clearly indicated by finger-posts, etc.

“The parade was apparently drawn up so as to occupy as much ground as possible, with the probable intention of making the relatively

small numbers of one army corps look to the best advantage. The infantry formation was line of half battalions, company columns. The mounted troops formed a second line as with our army; although the parade and march past did not present the brilliancy or the interest as a spectacle which is such a feature in one of our reviews, yet the sameness of the uniform, its sombre color, and the machine-like precision of the troops, lend a character quite its own to a Prussian review. The arrangements for the parade and march past were so complete as to make a mistake or a possible hitch in the ceremony impossible. For the march past the troops, cavalry as well as infantry, were formed up in mass upon the passing line within 200 yards of the saluting point before commencing. Distances and intervals were marked on the ground at the point from which the advance took place.

"As regards the infantry, their level appearance, and their soldierly bearing, was very striking; their steadiness on parade, and the precision with which they handled their arms, was also very remarkable, especially when it is remembered that their training lasts but two years at the most, and that therefore 50 per cent. of those before us could have only had one year's service. The "Parade Marsch" seemed to our unaccustomed eyes to be theatrical and forced. It is difficult to see its practical value, except as a steadying element in the attack. Its use is limited to 100 yards of passing line when marching past, as a salute to a superior officer, and occasionally at the assault. The infantry field officers' horses appeared to be well broken, were level in height, and similar in appearance, and there was no galloping about of over-zealous staff officers, and above all, there were remarkably few words of command.

"As regards the cavalry, the horses appeared to be of a good stamp and extraordinarily well broken. At the trot and gallop past, which are, however, much slower than ours, not a horse was seen to break the pace. All carry lances. The men's boots seemed tight and unserviceable. The bit is much lighter than ours, and the horses therefore not so 'bent.' The horse furniture is devoid of brass or shining metal and consequently looked plain and sombre. The horses looked to good advantage, as the manoeuvres had not yet begun. The march past was good, especially that of the 24th Dragoons (Darmstadt). There appeared to be no uniformity in the length of the tails of officers' chargers, the best of which had the look of being Irish hunters.

"*Artillery.*—The batteries were very weak in men and horses, and there were no wagons. The artillery horses are lighter and better bred than ours.

"*Staff.*—The staff were well turned out, and their horses appeared to be very level in size, and well broken.

"Upon the Sunday morning (September 5th) following the review a parade church service took place of the 13th Hussars (King of Italy's regiment), the XIth Jäger battalion, three infantry battalions, and some artillery, in the presence of the Emperor, Empress, King and Queen of

Italy, and a large assemblage of distinguished personages. The service was simple and decorous. The music and singing proved somewhat disappointing, as so much has been said of German Military Church music. The men removed their head-dresses during prayer, at a signal from the minister, which was effective and reverential, and seemed to be preferable to our custom of not removing the head-dress at all.

"After the service the troops marched past the Imperial party. The Jäger battalion then formed line, and the Emperor, in a short manly speech, with a clear ringing voice, announced to the battalion that he had invited the Queen of Italy to be its honorary colonel, and that her Majesty had done the German army the honor to accept. In future the regiment would therefore be called by her name. The battalion is one of the oldest and most distinguished in the Prussian service, and under another name fought, at one time, in British interest, and was in receipt of British pay.

"The Emperor and the Queen of Italy, followed by King Humbert, then walked down the front and inspected the battalion. After which the officers were brought forward and introduced to the Queen, together with the senior under officer. The officers, thereupon, again fell in, and the battalion presented arms, cheered, and the ceremony was over.

"The same care in elaborating every small detail characterized this simple and effective ceremony as at the review upon the 4th. Nothing seemed to be left to chance, and every care had been taken to avoid the possibility even of a blunder on some one's part. The spot had been thoughtfully chosen—an open space of grass in the park with a bank of trees nearly all round, whose foliage threw up the troops, and this, together with some gleams of sun lent a picturesqueness and brilliancy to the scene which made it especially attractive and impressive.

"It was remarked that hardly a word of command was heard throughout the ceremony, and that all, or nearly all, movements were executed by signal."

2. *Infantry Tactics (German). The Attack of two Bavarian Army Corps (six divisions) upon two Army Corps (six divisions) of Prussians on September 7th, near Hanau, and on September 8th, near Gross-Karben.*

It is no part of my intention to go into the detail of the operations which took place upon the 6th, 7th, and 8th, interesting as they were, but in order to make the extracts of my diary intelligible it is necessary to add a few words of explanation.

The General Idea had allotted to the Western (or Prussian) army the task of covering the exposed flank of an invading army moving eastward. The Eastern (or Bavarian) army had for its mission to advance, and strike the line of advance of the invader, and thus delay his further progress. Each army, therefore, as a portion of still larger armies, was allotted a distinct strategical rôle, and every latitude appeared to have been given to each commander as to how to solve the problems given in their respective Special Ideas.

The Bavarian army, consisting of two complete army corps and one independent cavalry division, was on the 5th a day's march south of Hanau. The Prussian army had one army corps at Frankfort, a day's march north of Hanau, and the divisions of the remaining army corps were distributed at wide intervals northeast of Frankfort, one division only being within a forced march of Hanau. The independent cavalry division covered the left flank of the army corps at Frankfort.

The Prussian commander upon the night of the 5th, at the commencement of hostilities, elected to take a vigorous offensive, and with his single army corps at Frankfort to endeavor to anticipate the Bavarians at Hanau, and on the Kinzig stream. Covered by the forests surrounding Hanau, he probably hoped to hold in check the Bavarians, although in superior numbers, until reinforced by his second army corps which had yet to be concentrated.

The operations of the 6th consisted therefore of this endeavor on the part of the Prussians to reach Hanau, which they failed to do before the Bavarians, who in their turn pressed back the weaker force of the Prussians upon the Hochstadt-Windecken heights. The vigorous offensive of the Bavarian commander did not seem to have been anticipated by the Prussian staff, and it would be interesting to know the verdict of the Umpire-in-chief upon his view of the solution of the strategical problem.

The operations of the 7th were consequently the continuation of the advance of the Bavarians from their positions near Hanau and on the Kinzig stream against the numerically weaker force of Prussians opposed to them.

"Upon the morning of Tuesday, September 7th, we left Homburg, by the kind permission of the German staff, in the Imperial train at 6.10 A. M., reaching Windecken at 7.30. Our horses, sent on by an earlier train, were there waiting for us. The weather of the previous day had been atrocious, but now showed signs of clearing.

"The outposts of both sides, who, in spite of heavy rain, had bivouacked all night in the open, had already been in collision, but the almost impassable character of the land, for the most part arable, after two days' heavy rain, necessitated some brief delay before the commencement of the operations.

"The situation of the troops after yesterday's engagement made the dispositions of each side in the morning easily intelligible. The Prussian divisions, four in number, were prepared to hold their strong but extended defensive position, while the six concentrated Bavarian divisions were being gathered for assault.

"Going straight for a solitary tree on the ridge which, marked Wartbaum on the map, is just above Windecken on the south, we heard distant firing, and having anticipated a determined attack by the concentrated divisions of the 1st Bavarian army corps upon Hochstadt, we moved along the ridge to above the village of Wachenbuchen. We soon

saw that the Bavarians were developing a very strong attack under cover of the Hanau forest, and this, at 10 A. M., culminated in a frontal attack by the 6th Bavarian division upon the corps artillery and divisional artillery of the 22d Prussian division, well posted on the strongly marked features of the high ground above, and to the east of Höchstadt. This assault, in the absence of all covering fire of Bavarian artillery, was properly held by the umpires to be unsuccessful, and the division was withdrawn to the bottom of the hill, where it remained to the end of the day. Meanwhile, the 1st division Bavarians commenced a very strong attack, which culminated in a judiciously planned assault at 11 A. M. Outnumbering the defenders, the Bavarians successfully turned the Prussian right, and after a well sustained and most interesting contest gained the crest line, and made good their foothold on the ridge.

"An attack simultaneous with that of the 6th division had also been made by the 4th Bavarian division of the 2d Corps upon the 21st Prussian division, which was held to be unsuccessful, and the Prussians, in their turn, following up their success at this point by a strong counter-attack, pressed their advance down the hill and into Müttelebechen, a village at its foot. This proved a fatal blunder, as it caused a wide gap in the centre of the Prussian position, thus leaving it open to the enemy, now pressing eagerly forward on their right. At this time, from the ridge where we stood, we were able to see the whole field, and could note the tide of battle as it ebbed and flowed with something akin to reality. We had, within sight, some 80,000 men engaged in mimic warfare, making up a scene not easily forgotten.

"The Bavarian 1st Corps had, by 11.45 A. M., firmly established itself upon the Höchstadt heights and again pressed back the single division opposed to it, until the Prussian right was, with difficulty, extricated from its perilous position, and retired towards Gross-Niedenderfelden. Heavy firing had also taken place on the extreme east of the field, and the attack of the 5th, 3d, and part of the 4th Bavarian divisions of the 2d Corps, covered by the corps artillery, had been also successful.

"The Prussians, outnumbered, were thus unsuccessful on both flanks, and fell back as best they might across the Nidder. ☼

"The 'Cease fire' then sounded, and hostilities ended for the time.

"The men were obviously very tired after the long march and operations of the previous day and with the outpost duty which followed, and although they were evidently glad to lie down before being told off to their billets, yet none seemed inclined to take off their packs, heavy as they are.

"Thus ended a most interesting and instructive day. Under a bright sun and fresh air the fields, still deep in mud, soon began rapidly to dry. The land is entirely arable and very rich. Immense damage must have been done to such crops as potatoes, seeded clover, peas, and swedes, and many fields were practically ruined by being churned up

under the gun wheels and by the troops marching across and through wet land.

"The situation at the end of the day's operations appeared to be that the four Prussian divisions had been driven in a north-easterly direction beyond the Nidder stream, and had been forced into a defensive position until they should be reinforced by the two remaining divisions of the VIIIth Corps. The Bavarians, with all six divisions in line, held the left bank of the Nidder and the heights of Höchstadt-Windecken.

"It was impossible for onlookers to have had better opportunities of studying the German system of attack than was presented to us at this most interesting mimic battle. The preliminary stages of the attack, like our own, are carried out by the firing and supporting lines of infantry in single rank at intervals varying according to circumstances; the reserves were, however, retained in close order, and even in company columns.

"The Intelligence Department handbook tells us that the German regulations are framed upon the rule that 'close order is the basis of all things, and that the principle always in view is to keep the men in close formation as long as possible, preferring to lose a few men rather than to let their commands get out of hand a moment sooner than necessary.' This principle is carried to such an extent that on many occasions it was observed that companies were kept in company columns at effective artillery and even at decisive infantry ranges. The idea is consistently observed that everything should be sacrificed, even human life, to a steady cohesive discipline upon the field of battle.

"The most extensive latitude is left to individual commanders as to when or how the final rush, or the prepared assault, for the enemy's position, is to take place. When the officer commanding the company, or it may be a larger unit, considers the decisive moment has arrived, he brings up his reserve, usually two deep, with arms at the shoulder, and in close formation.

"In extreme cases, and when the moment is considered most critical, the reserve comes up with the 'Parade Marsch,' drums beating a cadence, and the colors flying. The reserves having reached and reinforced the firing line, the whole break into a run and, with a cheer, endeavor to rush the position. Such is a German attack. The possibility of a check or a reverse does not seem to be contemplated. The only solution of the problem of attack, which appears to be permissible, is 'success.' The old principle of always retaining in hand a reserve seems, by the modern tactics of both German and French armies, to be a thing of the past. Napoleon's maxim is now held, so it would seem, to be out of date. In no case was any third line or corps reserve to be observed.

"The assault of the 6th Bavarian division upon the line of guns above Höchstadt was very instructive. It was made in a close formation, or more properly, in a dense mass, 14 or 15 deep, with drums beat-

ing and colors flying. By no human possibility could such an attack have succeeded, and the troops composing the assaulting lines and columns would have suffered immense loss. This was fully recognized by the umpires, who halted the division for the rest of the day. In this case, with no reserve or third line upon which to rally, it is difficult to understand what could have prevented in real war this division from lapsing into a condition of demoralization if not of actual panic.

"The silence and quietness which characterize all movements of the infantry are most remarkable. Each man seemed to know his place and what was expected of him, and he required no 'checking' by non-commissioned officers. The firing was entirely 'independent,' and hardly a volley was heard. The incessant orders and cautions of the section leaders, so characteristic of our own attacks, was therefore absent.

"The steady, almost machine-like, discipline insisted upon with the reserve was perhaps the most striking feature. No effort is spared by means of mechanical drill and precision to prevent confusion, to minimize skulking, and to make the timid firm in the critical moments of an assault.

"The individual initiative of all, including company commanders, is evidently fostered and encouraged, with the result that an attacking line when opposed resolves itself, as a rule, into a succession of minor tentative assaults, rarely by a brigade, sometimes by a regiment, more often by a battalion, and still more often by a company. The actual formation adopted is left to the idea and caprice of the individual commanders, and the actual assault is carried out as circumstances seem to indicate.

"It is open to question whether such a system of individual, spasmodic, and unsupported effort is sound against anything but a weak and indifferently disciplined enemy. The effect upon us as spectators was at once unpractical and unreal, and certainly the frequent weak attacks in close formations gave the impression that a terrible loss of life must be entailed, even if eventual success were attained.

"Officers, senior and junior, were very quiet and business-like, every one seemed to know what he was about and what was wanted of him. Above all there seemed to be no interference with the company or regimental officers by staff officers, colonels, or brigadiers."

Although the infantry tactics upon the eighth were similar to those of the 7th, there were incidents which were specially marked, and which are worthy of consideration.

"The morning of the 8th was very misty, and uncertainty as to the movements of the enemy appeared to be general among the Prussians. However that may be, certain it was that moving with the left brigade of the 22d division, who had been pushed forward to a more advanced position, we, with them, tumbled right on the top of a Bavarian brigade occupying the edge of a wood.

"The divisional cavalry were hugging the advancing infantry column, and neither scouts nor patrols had been sent forward. A small advanced guard of infantry alone was marching in front. The Bavarians lay still, and not until the Prussians had arrived within 300 yards did they open fire. It was a complete surprise, and almost amounted to an ambushade. The Prussians deployed with fair rapidity, but a very serious loss would have followed, and it was interesting to note that the divisional artillery at once backed up their infantry, and did their best, though at decisive infantry range, to retrieve the blunder. The corps artillery also came to the rescue by coming into action shortly afterwards and firing over the heads of their own infantry, and thus reassured the Prussians again pushed forward.

"Leaving this part of the field and moving north, it was found that the other brigade of the same Prussian division was in fierce combat with a large force of Bavarians, who, however, were unsupported by their artillery. The Prussians were being rapidly reinforced, and every effort was being made to gain the high ground on the right, commanding Gross-Karben and the Nidder valley.

"A very interesting and fluctuating fight took place, of which the salient features were that the tactics of yesterday were again repeated; isolated assaults by separate battalions, and even by single companies, were made in constant and rapid succession. The extreme precision with which the troops for assault were massed was again remarked. Two deep, with arms at the slope, with drums beating to mark the time, the reserves were brought up, and there was something peculiarly impressive in the slow, methodical, onward movement of a mass of men thus formed, resistless as a rising tide! It was, doubtless, very effective in appearance, and against irresolute half-trained troops should prove very demoralizing, but against steady infantry in line, it seemed a question if such a series of spasmodic efforts in attack could possibly succeed.

"The numerous attacks were, in nearly all cases, followed by an answering counter-attack when checked, so that each of the opposing sides became engaged in a series of minor combats, in which each in turn took the offensive and defensive, recalling Napier's accounts of the battles in the Peninsula in the days of good old Brown Bess.

"It did not appear that either side had any 3d line troops.

"The Prussian artillery was freely used, and pushed right up in support of the assaulting columns, and more than once a battery galloped up to fill a gap in the line, or to restore confidence to a flickering infantry struggle, at decisive ranges.

"So earnest and determined were the combatants, so quiet and business-like were the whole proceedings, that it was difficult to believe that the troops were, after all, only engaged in mimic war. Certain it is, that whether this system of isolated and spasmodic attack on the part of the Prussians be sound or no, it was most

inspiring to note how all units in the German army "back up" each other. There seems to be no better simile than that with which every Briton is familiar, and to liken the action of the Germans in this respect to a well organized foot-ball team.

"Each branch of the service would seem by an impulse to know when the moment of combined action or support is necessary. No shouting, no giving of orders is heard, but like a well ordered, well organized foot-ball team there is a general onward rush of combatants, each intent on his own rôle, and knowing each one when and how to assist his neighbor.

"It seemed to us that such a system of combined action and of comradeship form one of the most important characteristics of the German army."

3. *Cavalry v. Cavalry (French). Engagement on the 10th September, near Les Bœufs.*—In order to make the following incidents intelligible it is necessary to explain that the French manœuvres took place within an area defined by Arras-Cambrai-St. Quentin-Peronne. The Southern army consisted of one army corps provisionally made up, to which were added two divisions of cavalry, viz.: 1st (Paris), and 4th (Sédan) cavalry divisions, numbering approximately 52,000 infantry, 8000 cavalry, and 18 batteries. The Northern army consisted of two entire army corps and also of two divisions of cavalry, viz.: 5th (Mélun) and a provisional cavalry division, numbering approximately 50,000 infantry, 8000 cavalry, and 32 batteries.

The General Idea upon which the two armies operated were that the Southern army had been directed to cover the investment of Rheims against a Northern army sent to raise the same. An imaginary army corps was to arrive in support of the Southern army upon the last day of the operations.

The Northern army having assembled about Arras on the 8th September, marched the following day upon Bapaume. The Southern army having on the same day assembled on the Somme about Ribemont, advanced towards the same point with a view to delay the advance. Upon the 9th September the independent cavalry divisions came into collision south and south-east of Bapaume, and the advanced infantry followed by forced marches. The Northern army, whose cavalry divisions had been worsted, had succeeded in occupying Bapaume, however, with their advanced infantry, so that on the following day, the 10th, the advancing infantry of both sides came into collision south of Bapaume, while their flanks were covered by their respective cavalry divisions, one upon either flank.

Thus it happened that the following incident took place which may be taken as typical of many similar cavalry engagements during these manœuvres.

"About 11.45 A. M., the division of Northern cavalry protecting the right flank army was seen about three miles to the westward to be mov-

ing forward, and after a long gallop we arrived just in time to witness the following interesting proceedings.

"The above division turned out to be the provisional cavalry division and consisted of one brigade of Cuirassiers and one of Dragoons and Chasseurs, with two-horse artillery batteries, and a company of infantry cyclists. It was therefore weaker than the opposing division. The Southern cavalry was the 1st Cavalry Division consisting of three brigades, viz., one of Cuirassiers, one of Dragoons, and one of Chasseurs, with two-horse artillery batteries. This division when we arrived on the scene was not visible, and their opponents moving cautiously forward appeared to be as if searching for them. We rode forward to the high ground east of a small village embedded among trees, called *Les Bœufs*, where, hidden by an undulation of the ground, we descried the Southern cavalry division drawn up in mass, awaiting the signal to advance. Choosing a very favorable moment the division moved forward and deployed noiselessly from mass into line of squadron columns, and then into line. Not a sound was heard. Exactly at the right moment, as it appeared to us, they showed themselves on the crest line, and the centre or Cuirassier brigade then advancing at a trot formed the 1st line, the Dragoons, two regiments holding back, formed the 2d line, and the Chasseurs, in their turn, the 3d line.

"The Northern horse artillery came promptly into action and their cavalry brigades, in their turn, rapidly and silently deployed.

"The company of infantry cyclists with the Northern division had, in the meantime, materially assisted its cavalry division by occupying, before the commencement of the action, the village of *Les Bœufs*, directly upon their flank, thus preventing the enemy's horse artillery from gaining the commanding ground near the village, and at the same time bringing its rifle fire to bear upon the enemy's attacking squadrons at effective range.

"It was a unique and realistic sight as both sides broke into a gallop and with a cheer closed upon one another. Within four or five yards only did the opposing lines halt, and though the pace was relatively slow to that to which we in our service are accustomed, still, the ease and facility with which each side drew up and halted, silent and in close formation, spoke volumes for the good training of men and horses.

"The Southern cavalry had all the advantage of a surprise, of ground in charging down hill, and was also superior in point of numbers. All units conformed very rapidly, silently, and well to the situation. Each brigade and each regiment had its separate objective, and every squadron, without shouting, and without any special orders, made for the corresponding unit of the enemy.

"Nothing could have been better than the smoothness, the silence, and the rapidity with which this manœuvre took place, and it was difficult to realize that before us we had nearly 8000 cavalry and four horse artillery batteries, a force equal to the whole of the British cavalry now

serving in the United Kingdom. The remarkable ease and noiseless facility with which this large mass of men and horses were manipulated were little less than astounding."

4. *Infantry Tactics and Cavalry v. Infantry (French). Infantry fight near St. Quentin, 12th September.*

"Following up the General Idea which has been indicated, the Northern army upon the 12th September, from its cantonments north of Vermand, advanced against the Southern army which had taken up a defensive position upon the high ground south of the Omignon stream covering St. Quentin. The imaginary army corps was to reach the left flank of the position later in the day and reinforce the numerically inferior Southern army.

"The Southern line of defense was very extended, and covered five miles of front with a force of approximately 25,000 men. Considering that the Southern army was to be reinforced upon its left or western flank during the engagement by a second army corps (imaginary), it seemed as if the position was too much extended to the east, as indeed the result proved.

"The long line was weak everywhere and strong nowhere. This defect became later in the day still more accentuated, as eventually the right, prolonging its line more and more to the east, as if with its weaker numbers to outflank the Northern attack, became altogether severed from the centre and left. The effect of this mistake as it appeared to us would have proved fatal if the battle had been a real one.

"The attacking force, two complete *corps d'armée* and two cavalry divisions, numbered about 60,000 men, and the front occupied by these was, at the end of the engagement, six miles and a quarter in length, being about 10,000 men to a mile. The front of the defense was considerably more at the close of the fight.

"The battle began by the Northern army pressing forward and driving the Southern advanced troops from the villages lying on either side of the Omignon stream back upon the main position. Pursuing their advantage, the 1st Corps on the east pushed forward through Pontreue and Pontruet, and carried the high grounds commanding those points, thence developing a strong enveloping flank attack towards Les Trois Sauvages and Gricourt, so as to turn the right flank of the Southern army, and thus force them from the Châlons-St. Quentin road.

"The attack upon this point was of a most interesting character, as a definite objective having been fixed, a studied assault took place which with drums beating and colors flying was carried through with much spirit. The reserve and 2d line were brought up in close order and in step, and with drums beating the cadence. Neither here nor at any point after the preliminary stage could we see a 3d line or corps reserve on either side.

"The 2d Corps meanwhile held the enemy to the high ground above

the stream, but did not advance. The intention of the Northern general was evidently to cut off the Southern army from St. Quentin by outflanking and pressing back their enemy's right flank. To meet this powerful flanking movement the Southern commander extended his right wing more and more to the east, thus weakening his centre in front of the village of Fayet, which after a time became completely denuded of troops, and was eventually pierced with ease by the enemy, about 1.30 P. M.

"At about 1 P. M. the Southern commander, driven as it might seem to desperation, and as if to temporarily arrest his opponent's advance in the centre, two miles away, delivered an infantry counter-attack up the slope towards Thorigny on the extreme right of his line.

"This inexplicable manœuvre was met by the horse artillery batteries of the 5th cavalry division with the Northern army, and the Southern infantry were eventually charged in the most effective manner by the cavalry brigades of the same division. Standing behind the infantry I have no hesitation in saying that they would have been annihilated. Nothing could have been better than the manner in which this cavalry attack was conceived and carried out. The division forming in a roll of the ground manœuvred out of sight of the infantry and were only visible for the last 200 yards of their charge. Each portion of the division was flung with remarkable skill and rapidity upon a separate fragment of the extended infantry without noise, and without any especial orders. It seemed to be a triumph of successful leading.

"The infantry received the attack in an extended line, and without any attempt to close. The cavalry brigades charged well home and only pulled up five yards from the opposing lines.

"It is no part of my intention to be critical, but this counter-attack of the Southern army did not appear to be justified on any apparent grounds. With an inferior force, driven from an already too extended a position, the commander seemed to have endeavored to retrieve the situation by a still further extension, and by a manifestly impracticable offensive movement, which, under the circumstances, seemed to be nothing less than an act of desperation.

"Thus terminated a long day's operations which had certainly partaken as nearly of the realities of war as is possible in peace manœuvres. Lookers-on see the most of the game, and by the kindness of the French authorities we were especially able to observe the movements, tactical and strategical, throughout the day.

"The handling of the various brigades, regiments, and battalions was business-like and quiet.

"The infantry appeared to be much overweighted, and were frequently listless and devoid of energy, and of that *élan*, which is popularly credited to the French. The handling of the infantry was good, but the formations looser than with the Germans and well suited to the ground. The centre of each battalion in attack was marked by a very

small white flag which indicated the centre of the battalion attack. The firing was mostly by volleys, either standing or kneeling, little care being taken with the aiming or in adjusting the sight. The section commanders and the men did not seem to trouble themselves in this particular.

"The assaults were far less frequent than in the German army, and were undertaken by larger bodies, and with a more defined objective; but, on the other hand, the assault itself was not made with that precision, determination, and little regard to loss which is the characteristics of the German tactics. The leading of the men is not so silently conducted as with the Germans, nor is the discipline so strict.

"In neither army do the men when marching along a road or manœuvring keep step.

"An intrenching tool did not appear to be carried by the men, and the only intrenchments which we saw made were thrown up by the Southern force upon the heights above Vermand, and the tools were then issued from a regimental transport cart. Little care or pains seemed to be bestowed upon the shape or structure of the intrenchment, and in this respect differing very much from the German system.

"The handling of the cavalry on the whole seemed excellent, and the facility with which cavalry divisions of 4000 men and 12 guns are handled and moved across undulating and somewhat broken ground was most remarkable. Not a sound was to be heard, not even a whistle. The pace on all occasions seemed to be excellently maintained, and above all there was no increase of pace, no cantering or galloping to regain distance or change direction. The whole division worked upon the principle of "follow-my-leader," the leader being the general of the division, who was always preceded by a guiding peloton, distant about three quarters of a mile in front, with ground scouts at wide intervals. The division worked invariably in mass, and when preparing to attack, the flank brigades hung back to allow the centre brigade, of usually the Cuirassier regiments, to form line of squadron columns, and thence form line.

"The evolutions were invariably carried out without sound of any kind, and with a remarkable rapidity. The precision, regularity, and mutual understanding of each and every unit in the cavalry division could only be begotten of long and continual practice, and the result of a close acquaintance with one another individually, and of a thorough knowledge of drill and duty collectively.

"The Cuirassier regiments are remarkably well mounted upon horses of a better type than our heavy cavalry, the Dragoon regiments upon horses about equal to our Hussars, and the Chasseurs upon horses more like those usually given to mounted infantry, and are small, light, and unequal in quality.

"The saddlery is excellent, and better apparently than the German, as the man sits lower on his horse. The kit is firmly fixed, and there

are no loose hanging articles, such as our nose-bag and shoe-cases. The horsemanship is good, far better than is usual to credit the French cavalry with. The officers of the cavalry appear to be of superior social standing to those of the infantry, and the discipline seems of a higher order.

"The horse artillery seemed to be on the whole well handled, and the fire discipline seemed good. In all cases the horse artillery conformed to, and kept up close with, the cavalry divisions. The gun detachments worked nearly always in the rear; a great advantage, as it enabled the lead driver to see and keep his interval with greater ease. The horses are light and not equal to the German, but the gun is also very light. The service of the horse artillery appears a good one.

"Cyclists seemed to be much used for orderly duty. A company also of about 80 men had been especially organized as an experiment, and equipped with portable bicycles, which when not required for use were folded in two, and carried on the back of the soldier. This company was said to have done well, except upon the days when the weather was exceptionally bad, and the roads deep. Upon one occasion the cyclist company, attached as mounted infantry to the provisional cavalry division, did good service, as has been stated in the account of the operations on the 10th September, by occupying a village and lining the edges, thus forming a rallying point and a pivot for their cavalry division in their manoeuvres against their opponents. There were no signallers; nor was 'signalling' ever attempted throughout the manoeuvres."

#### PART II.—RETROSPECTIVE DEDUCTIONS.

(a) *The paramount importance attached in the German army to steady discipline and cohesion at drill, and upon the field of battle, more especially in the critical moment of attack.*

The German system is worth some quiet reflection. In these days of loose formations, when the exactitude in the details of drill are giving way to the inculcation of principles alone, it is as well for us in this connection to remember the fact that the successes gained by British infantry in the past, and their reputation for steady valor upon the field of battle, has been mainly due to their steadiness on parade, their exactitude in drill, and their unreasoning discipline on the drill ground, and therefore on the battle-field, characteristics which have been insisted upon by all officers conversant with the necessities for the successful leading of men in war.

The traditions of these great and fundamental principles in training troops for war, viz., exactitude in drill, precision and steadiness on parade, and rigid discipline at all times, is still maintained in many regiments, but it is, undoubtedly, also, in many regiments, being gradually lost sight of. It has especially survived in Highland regiments, and it is to this that may be traced the steady unyielding discipline which has won them fresh renown within the last 15

years, in Afghanistan, in Egypt, and recently upon the Indian frontier. It has been wisely said that men are much what a system makes them, and certainly in the case of our Highland regiments it is the system of methodical steadiness on parade and of an unyielding discipline which has made them what they are, rather than any especial characteristics of the men themselves, since it is well known that our Highland regiments are composed of men from all parts of Great Britain and Ireland. Whatever difference of opinion may exist among British officers upon these points there is an absolute unanimity among German officers. Every effort is made at all times to inculcate that precision and steadiness on parade which creates an unflinching discipline on the field of battle.

The reflection that arises incidental to this all-important point in the minds of those who have seen much of the battle training of our young regiments of Regulars, of our partially trained Militia battalions, and of our zealous Volunteers, is whether our system of training is such as to enforce these principles. Absolute steadiness when at attention, and complete silence at all times, are the primary conditions, and I will ask those present whether these primary conditions are always fulfilled. Perhaps the most essential part of the battle training of troops is that which they receive at target practice, yet it is precisely then when a laxity of discipline, of dress, and of military order and precision so frequently takes place, although the importance of the accurate shooting of the individual soldier on the field of battle is small compared to steady discipline.

*(b) The encouragement given to individual effort on the part of subordinate infantry commanders in attack and counter-attack.*

In considering this question and in following the lead of our German comrades in this particular, as the tendency undoubtedly is, we should bear in mind the characteristics of the two nations. The German with his stolid Teutonic instincts is naturally disinclined to initiative and to individuality. The system of military organization, as well as the national instincts, in Germany, are subversive of these qualities. The German regulations are therefore careful in their attack instructions and drill to teach a principle, which otherwise would be ignored. With British troops the characteristics are entirely different. The difficulty is rather to restrain and steady a too impetuous initiative in war. It is far more probable that British subordinate commanders may compromise the general plan of attack by an impetuous onslaught than that, by their slow understanding or lack of initiative, they will hang back at a critical moment and neglect to seize an opportune chance.

There are those who think that with the British system of small companies, with the large proportion of officers, and with their national characteristics, we should reflect whether too much latitude may not be given at instructional drill to subordinate commanders.

*(c) The silence and facility with which all arms are manœuvred without apparent effort.*

The highest test of training, and indeed of discipline, is to drill and move troops in silence and without words of command. It means knowledge, and that instinct of mutual confidence and trust which knowledge begets. The necessity of silence becomes only plain when large numbers of men are brought together for manœuvre or for drill. It then requires no argument to show that noise breeds confusion, and that confusion must bring disaster.

It is not fully realized that facility in handling troops, especially mounted troops, can only be acquired by practice. The art is not to be taught by books, nor does it come from study, nor is it a natural instinct. It is given to some to have a greater or less facility for acquiring the power of handling troops, but it is practice, and practice alone, which enables men to lead numbers and masses of men with the necessary silence and with success. In this particular the British officers of all arms and of all services suffer under the greatest disadvantages. Opportunities for acquiring this power are a pressing want. The slightest experience of our camps of exercise will suffice to bring this fact home to us. The yearly concentration of troops at camps of instruction for regimental, brigade, and division training is now recognized as an urgent necessity, and all earnest soldiers hope that ere long these opportunities will be general. It has been thought that much might be done, especially with the cavalry, by having skeleton squadrons or companies, regiments, or brigades, arranged by men in single rank or by flags.

It is a fact, which even a casual visit to foreign manœuvres will make plain, that German and French officers are our superiors in the manipulation of masses of men with silence and rapidity.

(d) *The mutual reliance and spontaneous coöperation which exists between all branches of the German army.*

The remarkable development of these valuable qualities in an army may be traceable to two causes (1st) that the officers of the German army form together one class of which the head is the Kaiser. A deep feeling of "Kameradschaft" permeates the whole body of officers; a sentiment which is quite apart from the individual *esprit de corps* of certain regiments. This spirit of comradeship fosters mutual reliance, and inculcates mutual esteem; (2d) that the system of local military organization creates such a thorough knowledge of one another, and such an intimate acquaintance with the powers and the failings of each and all, that mutual reliance and coöperative action follow as a matter of course. When the intimate acquaintance, socially and professionally, of each and all of the officers of a given military locality is considered, it is not to be wondered at that they yield one another a ready and spontaneous coöperation upon the critical occasions, such as the attack or counter-attack.

This spirit of mutual coöperation is curiously noticeable even to the most casual observer of any German military operation. In the French army it is undoubtedly less distinguishable, due, in a measure, perhaps,

to the officers being of a more varied social standing, and in a measure also to the strong part which politics play in France, and in thus preventing the welding together of the officers into one body animated by one spirit of comradeship and by a single-hearted feeling of patriotism.

(e) *The increased importance attached in the French army to precision and steadiness on parade and at manœuvres.*

One of the features in connection with modern French troops which most strikes a visitor is the silence and comparative steadiness of the men compared to what was customary before and even after the 1870 campaign. It is evident that no efforts are spared to inculcate the same principles of precision and of steadiness which is so eminently the characteristic of the German army. Although the French in their efforts to carry out these principles contrast as strongly in their different methods as they do in their national characteristics, still the result is that an immense change has been effected in fire discipline. Nothing shows this more clearly than the appearance of the infantry upon the line of march. Marching is carried out with a regularity, silence, and precision previously unknown. It would appear also that less latitude is given to subordinate commanders during the attack than is the case in the German army, and equal efforts are made to keep the men in hand to a late stage.

(f) *The excellence of the training of the French cavalry and the careful attention and study which the tactical action of independent cavalry divisions has received.*

For a British officer who has not seen more than two, or at most three, weak British cavalry brigades together, the ease, silence, and rapidity with which the French cavalry divisions are handled constitute little less than a revelation!

Not only do the men ride well and quietly, but the ease with which they are handled and worked by their officers shows that they are as well trained as horsemen as they are thoroughly well instructed in their duties as cavalry. Words of command are rarely given and all drill is, as a rule, done by signal.

Many Englishmen are inclined to under-estimate our neighbors across the Channel as horsemen, and to such, a visit to French cavalry manœuvres will be a wholesome lesson.

(g) *Detail less studied in the French army.*

In marked contrast with the close attention to details in orders, in drill, and in dress which characterize the German army, the French leave much to the discretion of individuals and to the sequence of events. The German soldier seems to live, move, and have his being "by order." With the French it is far less so, and the individuality of the soldier is more left to its natural bent, and the soldier therefore becomes far less of a machine.

## PART III.—SOME REMARKS UPON THE GERMAN AND FRENCH SYSTEMS.

The principles upon which military manœuvres are carried out seemed to differ in each of the two nations. In the case of the German Manœuvres ample scope existed for strategical as well as for tactical instruction. The greatest latitude was given to all, including those in highest command, so that opportunity was open for strategical combinations, which proved to be of a very interesting kind. On the other hand the French Manœuvres were rather a series of tactical exercises evolved from a prearranged strategical operation than an exercise in strategy, the higher art of war. This seemed to be especially the case with the cavalry divisions, whose commanders would appear to have had instructions for a morning and afternoon tactical engagement. Moreover, General La France, as Director of Manœuvres, commanded also the Northern army, for which reason alone the manœuvres could hardly be expected to have much strategical interest.

I do not propose to attempt the difficult task, even if I were competent to do so, of drawing comparisons between the German and French armies or of their military systems. The contrast between the two is practically the difference between the Teuton and the Celt. The careful calculation, the methodical organization, the dogged persistence of the German, and his deeply rooted national enthusiasm, endowing the whole military body corporate with life and energy, is in the sharpest contrast with the quick intelligence, the natural adaptability, the Celtic impetuosity, and the undoubted instinct for war of the Frenchman.

History repeats itself, and history tells the tale that victory more often than not is to the nation of strong individuality, rather than to the people who have preferred by nature or by force of circumstances to sink their individuality in the matured organization of the mass.

History deals in surprises.

## PART IV.

*The German and French armies contrasted (1) with the British Regular army (2) with the Defense Forces of Great Britain and of the Empire.*

The first question that suggests itself in seeing other European troops is how do they compare with our own, and the comparison made, as a rule, by our countrymen is the reverse of favorable. It is usual for us as a race to undervalue what is our own, and the tendency at the present time is to place small value upon our military qualities and to evince little respect for our soldiers.

In the case of our Regular army at least we have no reason to fear comparison. If we may believe our eyes and accept statistics the physique of our regular soldiers is certainly not deficient, if we except the small proportion of immature lads, and will compare far more than favorably with the troops of Germany or France. The smart and soldierly bearing of our men is unquestionably superior to that of our neighbors on the continent, where time can be ill spared for that finish

and polish which in former years were considered to be essential in turning out a soldier. As for officers, Great Britain has good reason to be satisfied. At no period in our national history has England had so many well trained and experienced officers as at the present time. Our numerous and varied campaigns in all parts of the world, and in all varieties of climate and of physical conditions, have afforded opportunities of practical training in war with all its infinite variety which should make our officers unrivalled.

Our regular troops are certainly not deficient in individual knowledge or in tactical training so far as small units go. Having a far larger proportion of officers to men than in Continental armies our troops now receive, thanks to the admirable system of field training, such personal instruction and direct supervision from their officers as no foreign army can emulate. Moreover their training extends over seven years in place of two or three. As regards shooting more trouble and individual instruction is bestowed by us upon musketry instruction and upon individual excellence in shooting than by any other nation, and with better results.

The comparison, however, between our Regular army and the armies of Germany and France is in reality not a fair one. European armies as now constituted are parts of the national life, and Europe can only be regarded as a congeries of armed nations! Our Regular army on the other hand is relatively a professional army, and apart from the national life, whose soldiers undertake for a term of years more than twice as long as that of the French, and more than three times as long as that of the Germans, to serve the state in any part of the world.

A professional soldier should be superior beyond any comparison, and when the overpowering responsibility which rests upon the British regular soldier is considered, his superiority in all military attributes should be exceptional and unchallenged. The Regular army of Great Britain is practically an imperial constabulary charged with the maintenance of order, and of our sovereign rights in all parts of our vast possessions.

The obligations laid upon our Regular army are world-wide, and the number of troops available are small indeed. It may be safely assumed that in the event of national complications leading to such a grave issue as a possible invasion of the United Kingdom, pressure would have been brought to bear upon us in many parts of our vast territories. The residue of our Regular army, after satisfying the requirements of an increased pressure in India, in West, East, and South Africa, in Egypt, in the Mediterranean, and in the West Indies, would be at best an inconsiderable force to cope with any national emergency.

The real comparison lies between the armies of Germany and of France, and the Defense Forces of Great Britain and the empire.

The expression "Defense Forces" has been advisedly adopted, as the military situation which brought into being the idea of "Auxiliary

Forces " has long since passed away. Our "Auxiliary Forces" in the United Kingdom are the veritable Defense Force for our shores, in the same degree as the "Colonial Forces" are the Defense Force for the colony to which each force belongs.

This comparison raises a deep and an abiding feeling of anxiety and concern. A visit to foreign manœuvres, a careful study of their method, and a knowledge of the vast military organization which control German and French armies, will leave only one conviction in the mind. However reluctantly, no professional soldier can form other opinions than that our Defense Forces, our "Auxiliary Forces," constituted as they are, would be incapable of making solid resistance.

The fair excellence or the zeal of individual corps does not constitute an efficient army. An army for war does not consist of a varied assemblage of battalions, regiments, and batteries, but of a force complete in all its parts, carefully organized and trained in peace so as to exercise its rôle when time of trial comes. Our auxiliary forces do not fulfil these conditions, and to pit gallant and zealous men against highly organized and carefully trained national armies would be but to sacrifice brave men and to court disaster. It is a solemn thought indeed, and one which reflection makes only more forcible, that the existing conditions of the military defense of the United Kingdom and the empire is nothing less than perilous. If there is any sanguine individual who thinks otherwise I would ask him to go to next year's manœuvres and note for himself the ways, methods, and perfect system of the Germany army.

#### THE FINAL DEDUCTION.

After considering the magnitude and the excellence of the German and French armies, the final and most momentous deduction is the fact that our Defense System is altogether inadequate to the existing requirements of the United Kingdom and of the empire.

Our army and our existing military system is practically that which was adopted during, and immediately after, the Peninsula War, when our over-sea possessions were far fewer, and when European nations maintained standing armies of comparatively small dimensions.

At the present moment we stand, with all the vast obligations of a world-wide empire, face to face with European nations in arms, whose hosts are reckoned by millions. Surely the time has arrived, with conditions so vastly altered, for a corresponding change in our military system.

You will doubtless recollect that in December last the Duke of Devonshire, speaking as President of the Defense Committee of the Empire, laid down with significant emphasis the Naval Policy of the British Empire.\* "I am asked," he said, "to make as public an announcement as can be made of the principles upon which these plans [of defense] are based, so that not only the Government, but every one of our

\* Speech by the Duke of Devonshire at the Guildhall, December 3, 1896.

Colonial citizens should know how much it is that the Government are prepared to undertake in the defense of the colonies, and the duties which in their turn they think ought to be undertaken by the Colonies themselves. The maintenance of sea supremacy has been assumed as the basis of the system of Imperial Defense against attack from the sea. This is the determining factor in shaping the whole defensive policy of the empire." This "most momentous pronouncement" has satisfied the whole empire and constitutes solid ground-work upon which to maintain naval efficiency.

Up to the present moment, however, a definite military defense policy has never been given to the public, but signs are not wanting that the nation is at last awakening to the necessity of a declared military policy based upon our military needs.

The primary military requirements may be taken in the following order:—

1. A comprehensive and generally accepted Military Policy based upon the naval policy already declared.
2. A definite scheme of defense for the whole empire based upon the military policy.
3. A military system upon the coöperative plan, which shall fulfil the conditions of the Scheme of Defense.

The Secretary of State for War has told us\* that "the possession of a large fleet does not relieve us from the need of an efficient army," and that "no country can be powerful for defense unless it is powerful for offense also." This last statement is a fact well known to all students of war. Our own history tells us that in the past the true defense of England has been a vigorous offensive. It has always been held that if warlike operations for defensive purposes are necessary they should be forced on England's enemies, and fought out upon other than English soil.

Accepting the principles of the Secretary of State for War we shall require—

- 1st. An army of small dimensions but high excellency for the maintenance of order, and of our sovereign rights in all parts of the world.
- 2d. A military force for offensive-defensive and defensive purposes through the empire.

As regards the first we have our existing Regular army, to which upon the coöperative plan our colonies and possessions might well be invited to contribute men† and money.

As regards the second it does not appear to be generally known that

\* Speech by Lord Lansdowne, November 13, 1896, at Bristol.

† The Dominion of Canada and the larger colonies of Australia have at various times volunteered to furnish troops for coöperation with Imperial troops, and the suggestion to interchange regiments between England and our Colonies has been most favorably entertained by our Colonial comrades.

the whole machinery already exists in the United Kingdom and in our Colonies for providing the requisite force by a Militia system. Such a force must, however, be complete in its proportion of three arms and in the administrative departments, and thus form an army complete in itself for its own rôle of defense.

In our Australian colonies, in Canada, and in South Africa the idea is gradually gaining ground that a coöperative system of defense, based upon a Militia Act, will meet best the peculiar exigencies of this vast empire of ours. This coöperative system, in which each portion of the empire should take its share, would provide for local defense, and for federal offense if need be, while the Regular army of Great Britain should be maintained as already stated for preserving order and our sovereign rights during times of peace throughout the empire, and for imparting a stiffening to our federal militia in time of war. Such a system of coöperative defense was proposed for and practically accepted by the Australian colonies, but is now being merged in the greater cause of general federation. Such is also the system that exists in the United States of America, while in Switzerland this federal Militia system has been brought to an especially high degree of military efficiency.

We are doubtless on the eve of grave discussions in Parliament and in the press upon military reform. None can more devoutly pray than we soldiers, who are now serving, that these changes, so imperative to the present safety and to the future maintenance of our vast empire, may not be narrowed down to the comparatively insignificant limits of the short service in the Regular army, linked battalions, or the future quarters of the brigade of Guards. Having recently had exceptional opportunities of gauging public opinion in our colonies, I am convinced that the time is at hand when our colonies with responsible government will be prepared to consider upon a broad and adequate basis the defence policy of the future.

I feel that I owe your Royal Highness and the audience an apology for so long detaining you, but if I have succeeded in providing some ideas for your further thought and consideration you will, I trust, for that reason forgive me.

#### DISCUSSION.

Colonel J. TALBOT COKE, D.A.G. : Colonel Hutton has called upon me to supplement his remarks, and I propose to give a few extracts from notes I made during the manœuvres, but as there are many here who will take part in the discussion, I shall not trespass for more than a few minutes on your time. I am sure that we have all listened with the greatest interest to my friend Colonel Hutton's most able lecture, and that very valuable lessons are to be learnt from a careful study of it. Many of us in this camp were fortunate this year in being able to attend both the German and French manœuvres, and our thanks are due to officials of those countries for having granted us field passes which enabled us to move about amongst the troops. The Germans and French have great advantages over us in the training of their armies. Their manœuvres

cover immense tracts of country with practically no forbidden ground. The actual ground must be unknown to the forces. Then the number of troops employed is immense, and large bodies beget large tactics, with a strategical lesson also to be learnt. We all know at Aldershot (our largest camp of instruction) how heavily handicapped we are in these respects. I now approach the very difficult point as to the encouragement given by the Germans to individual effort on the part of subordinate infantry commanders in attack. We were a large party of English officers at Homburg, and we usually went about in pairs, so that with operations extending over many miles of ground we were widely scattered over the field. Personally I did not see individual initiative exercised by company commanders in the attack, beyond that allowed to the leaders of the foremost units in early stages of the fight, or in wood fighting when the company necessarily must be an important unit. No doubt commanders of companies are allowed a freer hand when working as part of large forces than is the custom with us, but we must remember that the company in Germany, being a quarter of the battalion, possesses a relatively greater importance, and the commanders being mounted readily obtain the necessary orders direct from their colonel. Most certainly the combined action and comradeship (as stated by Colonel Hutton) form one of the most important characteristics of the German army. I agree also entirely with his remark that "with us it is far more probable subordinate commanders may compromise the general plan of attack by an impetuous onslaught, than that by their slow understanding or lack of initiative they will hang back at a critical moment and neglect to seize an opportune chance." Our small wars teach us the full value of the initiative, and our successes have often been due to the boldness of commanders of the smallest units. We must therefore be careful not to snub healthy initiative, but we must also be most careful that in large operations the general plan of attack of the commanders is not thereby compromised. I can fancy nothing more disastrous to a general plan than a containing force rushing wildly onto the enemy, and thereby leaving his centre open. In connection with the duties of containing forces, I think we have a lesson to learn from the Germans. We are apt to be in too great a hurry, and to think that something must be wrong, if our containing lines, when established in good defensive positions, are kept too long in them. I have seen German firing lines remain for an hour, or an hour and a half, without moving a yard, whilst important developments were being made in other parts of the field. There is nothing in the German or French tactics beyond what may be learnt in Part V. of our Infantry Drill. It all depends upon how we apply the guiding rules therein given. We do not make enough of obtaining superiority of fire, which is the key-note of the German instruction. Have we not seen weak attacks pushed home before the umpires could stop them, with what is called "hardly firing a shot"? "The necessity of pressing forward unremittingly" is laid down in our book, but I cannot read this instruction as overriding the importance of obtaining superiority of fire. We must not lose sight of our great object in the attack, to obtain by artillery and infantry the upper hand in the fire-fight. The German firing line moves to the front in quick time advancing by alternate fractions, but these fractions are as large as possible. Usually a battalion moves at once; advances by rushes are discouraged. The advance is thus carried out from fire station to fire station. Independent fire alone being employed, it takes some time to stop firing by the whistle, and thus the

advance is not carried out so rapidly as with us, and fire stations are occupied for a longer period than we are accustomed to halt. Let us remember that a different training is required for large armies to that which may suit small forces. The tactics of our drill book are those which will enable us to meet European soldiers, and the training can be easily modified to suit particular countries and irregular foes. Colonel Hutton has given a graphic description of the magnificent handling of two French cavalry divisions. His words can be equally applied to the Germans. Certainly one of the finest sights of my life was the charge of two German cavalry divisions, led by the Emperor himself against an opposing division. The absence of the third line at critical moments may, I think, be put down to over extension. The third line was provided for in the original German disposition of troops. I calculated that the usual front occupied would have been suitable had the units been on war strength, but they were unable properly to cover it with the lower establishments. Counter attacks, such a rarity unfortunately, with us, were always carried out, and in great strength. It appeared to me that umpires' decisions were, as a rule, against the attack, but favorable to the counter-attack. Fire discipline does not compare well with ours in either the German or French armies. Operations are very protracted; there is no fear of a battle not being fought out all along the line. In 1870 I was on the continent when the Franco-German War broke out, and I saw a good deal of the massing of the former troops on the frontier. Since that date I have not seen much of the French army, and I was most favorably impressed with its great improvement. Divisions were very well manoeuvred in avoiding open glacies until turning movements enabled the use of the ground. A last word as to the German attack. One cannot help feeling that their tactics are framed on their one determination, at all costs, to succeed. The handling of the infantry, having this in view, is superb: (1) Great fire effect, so as to gain a superiority of fire. (2) No wild unnecessary rushes; no hurry. (3) Lines kept well separate, and distances between them well preserved. (4) Closing of the second line on right points for assault. By these, and by means of an iron discipline, the Germans intend to be successful, and they are the greatest military nation.

Lieutenant-Colonel F. J. W. EUSTACE, R.H.A.: Colonel Hutton has gone so thoroughly into the main lessons of the German and French manoeuvres that I will only trespass a very few minutes on your time, and confine my remarks to my own branch of the service, the artillery. As regards detail we have not much to learn; our artillery, as far as it goes, is better horsed and equipped, better driven, and (judging without seeing practice) I think our fire discipline is better. Just in one detail I do not agree with Colonel Hutton. He says "working with detachments rear in horse artillery is a great advantage, as it enables the lead driver to see and keep his interval with greater ease." I think Colonel Hutton has been misinformed on this point, as it is not the duty of the lead driver to look to the interval; on the other hand, there are many disadvantages, too numerous to go into. One thing is, I think, certain, which is that German and French horse artillery are slower than we are at coming into action; so why imitate them? As regards tactics the main principle of using their artillery in both the German and French armies (to the most marked degree in the German) is that of (as Colonel Hutton well expresses it) backing up the other arms, *i.e.*, backing up infantry in the case of field artillery and cavalry in the case of horse artillery, which these arms reciprocate. In other words

the coöperation of the three arms is a very marked feature. Whether it would be possible in battle for artillery, or even for infantry, in such masses as we saw in Germany, to remain, or even get so close to each other, is another question. It was reported out there that one of the German generals remarked: "If this goes on in war there will be no one left to bury the dead." One other matter I will touch on for a moment; most of us artillerymen have heard a great deal lately of the so-called "German method of bringing guns into action," which consists of halting under cover, unlimbering the guns and running them up by hand. At the German manœuvres there were some 600 guns in action, and some half-dozen artillery officers anxiously looking out for this method. I have consulted most of them, if not all, and from their experience and mine the German method is a sort of "Mrs. Harris." It does not exist now, whatever it may have done in the past, or if it does exist, it is not used at the big "Kaiser" manœuvres. I may add that Colonel Grierson, our military attaché, who has a very wide experience, tells me he has never seen it used. To conclude, I said our artillery has not much to learn "as far as it goes," unfortunately it does not go very far:—

	Battalions.	Strength.	Guns.	Proportion.
France.....	25	24,000	120	5
Germany.....	25	23,700	120	5
Great Britain.....	25	24,700	102	4.2

In France and Germany there are 120 guns per army corps of 24,000 (infantry), *i. e.*, 5 guns per 1000. In Great Britain there are 102 guns per army corps of 24,000, *i. e.*, 4.2 guns per 1000. So that we allow nearly one gun less per 1000 for our two army corps (which have never got beyond paper) than the Germans and French do for their large number of army corps which really exist, and besides this, our auxiliary or defense forces have practically no field artillery. Colonel Hutton says very truly that the country looks for a definite military policy which must include (besides a small and efficient army) a military force for the offensive-defensive and defensive purposes of the empire. Whatever the conditions of service of this force may be (*i. e.*, whether voluntary or involuntary) if it has not its due proportion of guns and cavalry, neither of which can be improvised, it will be more or less a sham, and if we rely upon it for those purposes we shall not only chance disaster but court it.

The Right Honorable SIR CHARLES DILKE, M.P.: Colonel Hutton asked me to come here this evening presumably because I have had some experience as a civilian of some of the same class of questions as those which he has so ably treated. I have seen a good deal of the German and French armies which he takes as a standard of comparison, and I have also some knowledge of the Australian and Canadian forces which he has included in his valuable deductions. My experience of the German army is old; I was with the Crown Prince's forces in 1870, but since then I have not seen much of the German troops, except during the drilling of their recruits in the autumn time in Metz and Berlin. With regard to the French army, I was present at the largest manœuvres they have had, namely those of six years ago, when four corps—one the great 6th Corps, since divided into two corps—were manœuvred as a single army against a skeleton force of 16,000 Chasseurs and marines, and to give some idea of the numbers engaged, I may mention that on one afternoon 127 batteries of artillery were firing at a single objective. I have also seen some of our troops in India and have witnessed eleven regiments of cavalry being handled to—

gether ; so, as a civilian, I am able to form some sort of comparison between these various armies. The only point of detail which I am a little astonished to hear from Colonel Hutton concerns the improved leading of the French cavalry. In the last six years the French must have greatly improved their cavalry. They have worked very hard and made great progress. Six years ago, however, they were not at all satisfied with their own cavalry leading. Now to come to the actual main point in the paper. I should like first of all to call attention to these words which Colonel Hutton evidently emphasizes as being the main object of his discourse. "The relatively small portion only of the military forces of the Queen" in comparison with "the great mass of troops in Britain and Greater Britain which constitutes the real defense of the empire." I fancy the problem to which he has given the greatest attention is how to make that great mass a more efficient adjunct to the Regular army than it is at the present time (hear, hear). He has alluded especially to the self-governing colonies, but omits the Crown Colonies which contribute towards the cost of the Regular army. Those contributions have, however, from time to time been reduced. Comparing Singapore and Ceylon as small though rich colonies, with India which is a poorer country, if it is just that India should pay the full cost of its army, the contribution from the colonies should be larger. The Cape, inhabited chiefly by a Burgher-Dutch population, might be more reasonably asked to contribute to naval defense than to take any general part in the defense of the empire. As to Canada she has an organized militia service which, however, has been reduced from 40,000 to 36,000. The frontier of Canada is one of such extraordinary length and difficulty that that is a very small force with which to meet an emergency. We may hope that Canada will improve her own defenses, but we can hardly hope for her to contribute to the defense of other parts of the world. The Australian colonies are protected by the supremacy of our fleet and towards that they make a very small contribution. They possess excellent military forces which the Jubilee has made us acquainted with at home. These forces undoubtedly would in certain exigencies be offered to us.

General H. R. H. the DUKE OF CONNAUGHT : They have been offered.

Sir CHARLES DILKE : Yes, and no man knows better than Colonel Hutton that just as they have been offered on one occasion so they will be offered in future. It certainly does seem that the main suggestion in Colonel Hutton's paper is that steps should be taken in time of peace to organize that contribution towards defense which Australia would make in time of war. Australia has a deal of interest in the trade of India and no doubt there are conceivable cases where Australian assistance to India in the future may be of the utmost value. Therefore, one of the great lessons of Colonel Hutton's paper is to prepare in time of peace for making good use of, and allowance for, the assistance we may receive in time of war, which Australia would be ready to give. It is in the form of defense federation rather than of political federation that we must view these possibilities. There are a few remarks of Colonel Hutton which I would next like to read. He says : "It is not fully realized that facility in handling troops, especially mounted troops, can only be acquired by practice, and that the art cannot come from book instruction." Some of us have worked pretty hard to obtain better facilities for practice by the British army and I believe the Manœuvres Bill will have that effect ; but I think pressure might be exerted to cause these manœuvres to be held on a large scale and frequently. There was an un-

fortunate phrase, and one which was quite unnecessary, used in connection with that bill to the effect that such manœuvres should only take place every three or five years. I hope every officer here agrees that these manœuvres are essential on the largest possible scale every year, and that every endeavor will be made to bring this about. (Applause.) Colonel Eustace speaking of the small force of artillery which we possess has taken a very unfortunate standard of comparison, viz., the number of guns to men in the army corps. This has been put forward by successive governments, eliciting the reply that on this score we ought to be satisfied. This is one of the most painful and discreditable items which one could name in the political history of the army. A number of years ago the artillery was reduced, under another government it was "increased"; but the result was not to increase but to diminish that arm of the service. At last, however, there was an increase, but it was by a single battery, and the argument used at that time was just that same unfortunate argument, the proportion of guns to the army corps. If we are to count our volunteers and militia, then, at all events, you must have some sort of field artillery for them. It may be a professional force, or a mixed and cheaper force, but some sort is a necessity. (Applause.) I should say that the peculiar character of the British army causes it to require a larger force of field artillery in comparison with its size than any other army in the world. We know it is necessary to have a proportion of this arm to serve with the militia and volunteers, or any force to take the place of these, and no doubt in time they can be provided on a cheaper scale than in the professional army. The Swiss do it on a militia system. Indeed it is remarkable to any one who has attended the Swiss manœuvres how perfect are all branches of their service, except perhaps their cavalry, both in the actual results to be seen in the field and the rapidity of their mobilization. It is extraordinary, and it is done on a militia system. We have outside our Regular army a force of garrison artillery, but the auxiliary troops have no field artillery attached with the exception of one or two toy batteries maintained by rich men. We have no material force of this necessary arm. I think Colonel Hutton has taught us some valuable lessons in regard to the employment of the great mass of our troops, and this is one of their requirements. There is one point in the lecture which I may be forgiven for taking exception to. Colonel Hutton said: "The tendency at the present time is to place small value upon our military qualities and to evince little respect for our soldiers." I do not know where he has found this. I have watched a great deal of public opinion and I have not seen any recent increase in the want of respect for the individual qualities of the army to which he alludes, which I think, on the whole, stand higher than before. Any want of respect lies with the army viewed as to modern requirements, and the fault rests with the War Office which does not know how to combine modern systems with modern requirements in the proper sense of the word. Colonel Hutton thinks that through the training our army receives in all parts of the world it must necessarily be better trained than other troops, and that no foreign country can emulate us; but we must not forget the complaint that French officers of the Algerian school never did well, while on the other side Prussians trained in times of peace behaved exceedingly well. So history does not always support this view and we must not over-rate the teaching of the field against the teaching of the school. The real lesson of the lecture is that our Defense Forces, as they stand, will not be capable of making a solid resistance. As Colonel Hutton puts it we require a comprehen-

sive and generally accepted military policy based upon the naval policy and a definite scheme of defense for the whole empire. In connection with that Colonel Hutton points with hope to arrangements being made with the colonies, and I have tried to supplement the need of these arrangements which I think with him may be made.

THE LECTURER : I do not know that the remarks of Colonel Talbot Coke and of Lieutenant-Colonel Eustace call for any comment on my part. Our general deductions appear to have been identical. Sir Charles Dilke, as regards the most important intention of my paper, has exactly hit off the point to which I wished most forcibly to direct your notice. This point is the absolute necessity all we officers feel as to the declaration of a military policy which shall form the basis of our military system. We cannot but all feel how absolutely important it is to have this policy definitely indicated to us. We in the Regular army realize that we are part of a whole, but we want to have it stated exactly what functions we are intended relatively to fill. What is to be the rôle relatively of our auxiliary forces at home and of our defense forces in our several colonies abroad? It has been my good fortune to serve not only in the United Kingdom with all branches of our forces, but also in the Antipodes and other parts of the empire, and it was also my good fortune to witness the work of the Swiss army to which allusion has been made. I can only say that the Swiss militia is the typical form to which our defense system might be made to approximate with little expenditure of money but with a large expenditure of thought, careful administration, and much farsighted organization. The whole question is primarily not one of money but of organization, and we soldiers plead to be treated as business men, and to be told definitely what is required of us at the hands of the Government and of the nation. We earnestly trust that the question of military organization and reform so urgently needed may be treated upon comprehensive and business lines. We hope that some fundamental system of defense for the whole empire may be formulated, and in this respect that the army may be treated in the same manner as the navy has been by being given a definite basis to start from. Without some such accepted policy of defense for our guidance we can hope for little really practical or sound reform. I feel under great obligation to Sir Charles Dilke for so ably adding his powerful voice to the remarks which I have made in all deference. My paper was intended to be suggestive rather than dogmatic, and I have merely endeavored to submit for your consideration and reflection some of those deductions which were most forcibly brought home by a recent visit to the German and French Manœuvres of 1897. In conclusion I have again to thank your Royal Highness and all the large audience here this evening for their very kind reception, and for the patient hearing which they have been so good as to accord to me. (Applause.)

General H. R. H. the DUKE OF CONNAUGHT : It now devolves upon me to thank Colonel Hutton very much for his paper, which is so full of interest to every one present. There are many officers here who are acquainted with both the French and German armies, but Colonel Hutton having seen their work only two or three months ago causes the impressions he formed so recently to be of all the more value to us. Personally I know a good deal of the German army; I have attended their manœuvres many times; I am also connected with their army, and I have been through every detail of their instruction and administration. The French army I have not seen since 1877, and if I do not

say much about them it is because I am to a great extent personally ignorant on the subject, but from the little that I saw and from what Colonel Hutton has told us they have evidently improved in a marvellous manner. However, I only saw them on parade, and that is not sufficient to form an opinion on their war efficiency. With regard to the German army the one cardinal point of its efficiency as an army is the strong sense of discipline which exists from the Emperor down to the last joined recruit. That is the keynote of their instruction, of their movements, and it is to attain that that some of the operations to which Colonel Hutton alludes are executed, such as the "Parade Marsch" coming at a decisive point in the battle. It is done to make the men feel they must succeed and that they are "marching to success," and that although projectiles are flying about them they must not be afraid, but that they must move with precision at that momentous moment. One of the chief lessons we have learned from Colonel Hutton's remarks on the German army is the wonderful knowledge that the different arms possess of the general situation. Each arm knows what the other does and where to assist them, and as several speakers have said this mutual support which they show so strongly is derived from the constant manœuvres they have every year. These manœuvres are held on ground which is not known to them. Their battalion and brigade instruction is on known ground, but when the manœuvres take place fresh ground is provided; they are allowed as much latitude as possible, and everything is done to bring the work as near service conditions as it is possible to bring it without bullets in the rifles and shells in the guns. Colonel Hutton alluded to the feeling of good comradeship between the officers in the German army, and this is indeed remarkable. In this respect they are like school-fellows. It seems a sort of instinct with them; they belong to the same service, the same profession, and they will always back each other up. Coming to the last deduction, we all of us must desire to see the Government of the day settle our military system by providing what is suited to the exigencies of the empire, and to the capability of the different parts of the forces which comprise our army. We do not know what the relative position is intended to be between the Volunteers, the Militia, and the Regular army. We hope the serious discussions now going on in the Cabinet and the War Office may be productive of lasting good, not only to the troops of this country and the colonies, but the empire at large. I have to thank Colonel Hutton, who was the first Secretary of this Military Society, for his exceedingly valuable lecture, and the two distinguished members of Parliament, who have come here this evening, for their presence on this occasion.

Major-General BARNARD proposed a hearty vote of thanks to his Royal Highness the Duke of Connaught for his kindness in presiding.

## THE ARMAMENT OF BRITISH CAVALRY.

By VINCULUM.

*(The United Service Magazine, London.)*

OPINIONS as to which is the most suitable cold steel armament for British cavalry are still very diverse among even cavalry soldiers, and considering the very varied descriptions of warfare, varied both as regards the theatre of war and the enemy opposed to us, that our cavalry may be called upon to undertake, the widely opposed opinions of experts on the subject of cavalry armament is not a matter of very great surprise.

As regards the fire-arm of cavalry, I do not think much divergence of opinion exists among modern cavalymen. Its value, though at one time scoffed at, has come to be appreciated at its true worth by those who consider the varied uses of cavalry in modern war. A rising cavalry leader lately remarked as regards cavalry, that "fire-arms have created a new arm altogether; not only is its independence and self-reliance increased by the fact that it can protect itself in cantonments and tight places, by day and by night, but it is given an aggressive power, in close country, equal to that of the mounted riflemen of the American wars. Where, however, opinions differ as to the carbine, it is as to the manner of carrying this arm; but, in spite of various arguments to the contrary, I am still of opinion that the proper place in action for the carbine is on the man, for the sword on the saddle. Dismounted troopers in our latest charges on the N. W. frontier are strong advocates for this system.

As regards cold steel, however, which is the main subject of this paper, even on the Continent, where in matters of strategy and tactics the considerations of savage warfare are, compared with our army, practically *nil*, the controversy of lance *versus* sword still discloses many advocates among all ranks in the mounted branches opposed to one another.

Colonel Neville, 14th Bengal Lancers, in his paper before the United Service Institution of India in October, 1896, considers the question a threefold one as regards our cavalry, viz., whether they should be armed with lance in both ranks, sword in both ranks, or the lance in front and sword in rear rank, and this is practically what any final decision, if there is such a thing as finality, must arrive at.

Colonel Elliot, 3d Bengal Cavalry, in his "Notes on Cavalry Literature, treating more especially of its Armament," goes very fully into the matter and gives us the opinions of many recognized authorities on the subject, both British and foreign, opinions not merely theoretically valuable but of practical weight, coming as they do in many cases from

well-known cavalry leaders who have actually been in the position of commanders of large bodies of cavalry in the field.

*Les lettres d'un Cavalier* on "La tactique et l'armement" in the recent numbers of the *Revue de Cavalerie* are also full of valuable information and historical research on this subject, and provide much interesting reading for cavalry soldiers or, in fact, for soldiers of any branch of the service interested in the question.

To start at the root of the matter it must first of all be decided to what use in war do we intend to put our cavalry, both European and Indian, and it will be admitted by all that all our cavalry must be prepared to work, both extended and in masses, and to be able to take their place in shock tactics, in *melées*, and in reconnaissance work. Now most authorities, though there are not a few exceptions, Dragomiroff among them, are of opinion that for shock tactics the lance is the most suitable weapon, while for the *melée* the sword is best. This was Napoleon's opinion as early as 1807, though it was not until 1811 that, by a decree dated 11th November, he attached a regiment of lancers to each division of cuirassiers. Marmont was in favor of lances for the actual shock of a charge, though he favored the sword for the *melée*; "il foudrait," he wrote, "en armer le premier rang de tous les régiments de ligne et de grosse cavalerie." Dragomiroff, on the contrary, does not look with favor on the lance, preferring the sword as the arm for cavalry in all emergencies. "La lance," says he, "est surtout avantageuse contre des ennemis peu enclins à corps à corps, mais si l'ennemi loin de fuir le corps à corps le recherche, l'arm de taille est préférable pour la cavalerie à l'arm de choc (the lance)."

This remark of Dragomiroff leads up to two points, namely, the undoubted rarity in modern warfare of what we understand by, and what we train our men up to, viz., actual shock tactics of a charge by formed bodies of cavalry driven home; and, secondly, the moral if not practical effect of lances on one's enemy.

The final goal of all cavalry training for shock tactics is cohesion in the charge, and to this end our troopers are trained. We, like the Germans and French, put our faith in cohesion and compactness in the ranks for success in a cavalry charge. We still recognize the necessity of cavalry being trained to meet cavalry in the field in unbroken line, and we still recognize the possibility in future wars of two formed bodies of horse soldiers charging one another, and meeting with a crash on impact. Further, the tendency to employ cavalry in large masses, and therefore to train them to manœuvre together in those masses, must lead to their use on the battle-field in masses, and no commander would let such a weapon as a cavalry division lie idle. If there is an opposing mass of cavalry, both will come together like corks in a teacup of water; if there is none, our cavalry will be used against infantry. Given suitable country, cavalry charges on a large scale are certainties in modern war. Therefore training for these tactics is still as necessary as ever,

though the opportunities for putting them into practice have become during the present century rarer in the field. The charges of cavalry in mass were, it must be admitted, far more frequent during the eighteenth century than during the wars of the present century, and it is this fact that has modified men's opinions to a great extent, both as regards the tactical training and armament of cavalry. In the three campaigns in Silesia in the last century there was hardly a single battle that was not decided by the cavalry, and Rossbach was almost entirely won by the mounted branch. Whereas, as Prince Kraft writes, "the history of the war of 1870-71 speaks of more than twenty great battles and a considerable number of engagements and actions, in which the number of combatants was larger than in the great battles of the Seven Years' War, and in all these combats masses of cavalry have been used by the Prussians only once, at Mars-la-Tour, and by the French three times at Wörth, Mars-la-Tour, and Sedan, while besides these there has been but one charge (at Loigny) by a force as large as a cavalry brigade."

Even in the earlier wars, when the cold steel of cavalry had greater scope, the occasions when both opposing forces of cavalry met by shock was comparatively rare, for most frequently one or the other gave way before the final charge could have taken place. Jomini writes (in his "Art de la Guerre," p. 252), "Le fameux coup de poitrail n'est qu'un fantôme dont on effraie les cavaliers sans expérience de la guerre." Marmont wrote (in "de l'esprit des Institutions Militaires," p. 42) "Poursuivre l'ennemi est l'office habituel de la cavalerie, car il est rare que les deux partis se heurtent." General du Barail in "Mes Souvenirs," says also, "Jamais deux troupes de cavalerie ne s'abordent à la charge. L'une d'elles est toujours rompue avant que le choc se produise, comme si elle éclatait sous la puissance irresistible de l'air comprimé." While, to quote a more recent authority, Colonel Cherfils, in his "Cavalerie en Campagne," says, "L'action de la cavalerie se résumait non en le choc de deux impulsions matérielles mais en la lutte de deux impulsions morales."

However, in spite of these opinions, there is absolutely no sign as yet that the days of cavalry shock tactics are forever over, and consequently training in this part of a cavalryman's duties in the field will still continue to exercise the minds of cavalry experts, while the trooper himself must be taught that absolutely perfect training is as necessary as ever for successful charges by cavalry either against their own arm or against infantry.

The question then to be settled, in the first place, is what is the best cavalry weapon for shock tactics against either horse or foot soldiers, whether, as according to Dragomiroff, the sabre meets all requirements, or whether the lance is not the queen of weapons for this purpose? Ask any sower of our native cavalry, ask the French or German dragon-lancier, or ask a British dragoon or hussar, which weapon he feels most at home with both for offense and defense, and he will, considering only

his own personal and individual case, vote for the sabre. Take also the results of the war in Cuba, and the "machetti" of the Cuban horsemen has gone far to prove that the days of cavalry charges are by no means ended, and that the sword, scimiter, tulwar, and machetti are by no means out of date even as weapons of offense in shock tactics. However, in reality the matter is one of comparison, and although at first thought the horse soldier may favor the sword, the inclination towards the lance soon comes when he drops the individual for the tactical unit. "Qu'on place," says "le Cavalier," ce même homme, le dragon-lancier en face de la réalité du fait; qu'on lui présente à cheval deux escadrons, deux lignes de cavalerie, l'une armée du sabre l'autre de la lance—les lanciers sachant simplement exécutés ce brusque mouvement d'abaissement des lances, la pointe au corps—qu'on fasse avancer ces deux lignes l'une contre l'autre, et qu'on l'arrête à cinq mètres, front contre front, face à face, ayant l'une à l'autre une mise en garde horizontale. Si on demande alors à notre sabreur de choisir sa ligne, il se prendra celle de lances. La vision du fait, l'aspect de la ligne hérissée de pointes à modifié instantanément sa conviction, a fait exécutés volte-face à sa conviction au moment critique, ses croyances lui ont fait banque route."

That there is a great deal of truth in this argument will be admitted, for even for one moment presuming that the actual effect of both weapons are equal, the moral effect of the lance is for the purpose of the attack undoubtedly superior, and as moral effect in a cavalry charge in nine cases out of ten takes effect before physical effect has time to come into play, and produces disorder or flight on one side or the other, the lance for purposes of the first line in the attack should be able to prove itself a superior shock weapon to the sword or tulwar.

This, however, refers only to the actual charge, the launching of the first line of attack on the enemy, for once the shock has occurred the advantage of the longer weapon no longer appears. This at least will be granted by most men, though "Le Cavalier," who is a fanatical advocate of the lance, goes even so far as to say, "Si les deux lignes sont restées cohérentes, et c'est le desideratum tactique des deux adversaires, il me paraît difficile de ne pas admettre que l'avantage sera du côté des plus longues pointes, les pointes que les premières arriveront au corps, mathématiquement, par le seul fait de l'impulsion des masses, la ligne de sabres sera, de l'abord, en partie trûée, culbutée. Et de ce choc initial résultera non plus une mêlée à conditions égales, un corps à corps prolongé et sur place (comme le pensent les adversaires de la lance) mais bien une sorte de bousculade brève une rupture d'équilibre moral, d'un côté la fuite, de l'autre la poursuite." Such is the opinion of an advocate of the lance; but in spite of this I think it will appear to the ordinary cavalry critic that "Le Cavalier" has in his mind only the primary result of shock tactics, viz., the impact of the actual front ranks of the attacking line and supports, and has somewhat counted the final results without taking into consideration the arrival of the *mêlée* troops, namely,

the remainder of the original rear ranks (for I do not hold that every rear rank man will, at point of impact, be alongside his front rank man), the reserve and supporting lines, who would do much to turn the scale in the second stage provided they were armed with weapons suitable to that stage, and unencumbered with an arm effective particularly and peculiarly in the charge only.

This brings one to the division of cavalry armament, the extent to which our forces should rely on each arm, and the manner in which they should be equipped so as to be ready for all emergencies.

It will therefore be as well to start from this definite point in the argument, and in spite of the opinions of Dragomiroff and his school, to allow that for shock tactics of cavalry *versus* cavalry, and for offensive purposes of cavalry *versus* infantry either in formed masses or in broken or extended order, the lance is, taking it all round, the most suitable weapon both morally and physically.

It is, however, quite unnecessary in admitting the above to go so far as to say that for general service the lance is always preferable and more effective than the sabre or tulwar. For purely *mêlée* purposes, the opinion of the large majority of cavalry leaders of the present day, both at home, in India, and on the Continent, is that the lance for a close quarter *mêlée* is unwieldy and cumbersome, while the sword and tulwar are more easily and more effectively brought into play. This is no new departure in cavalry opinions and no novelty in the history or art of war. Napoleon, Wellington, Marmont, Poniatowski, Latour-Maubourg, St. Cyr, Sir Charles Napier and a host of others, while admitting the advantage of the lance in its proper place, are in favor of the sabre and tulwar for the *mêlée*. Any individual trooper or sowar who has wetted steel on the battle-field will give this as his opinion, and the results of such trials of skill in lance *versus* sword at military tournaments go no little way to prove the advantage of the sword or tulwar over the lance in a *mêlée*.

Touching the formation of a first line in a charge, a great deal has been written and spoken in favor of the charge taking place in one line, that is to say, in one line of single rank only, as opposed to our existing regulations which provide for a rear rank at (except in certain cases, *vide* Pt. I, sec. 15, page 45 of the drill) one horse's length behind the front rank. However, our regulations for practising the charge in two ranks remain, and the supporters of the double rank charge are if anything stronger than those who are advocates of a single rank formation, especially among our European cavalry. This question, however, is one that seriously affects the armament of the rear rank. If the rear rank is primarily and chiefly intended to fill up the gaps in, and complete, the front rank just before the moment of shock, then naturally their position should be as laid down, and their arms should be the arm for shock tactics, *viz.*, the lance; but to expect them at the critical moment to keep their weapons at the carry in the bucket, is to expect more than human nature can promise, and as a matter of fact in real warfare as

described by a British cavalry officer who has served in both hussars and lancers, "when the charge sounds for real conflict the rear rank men bring their lances to the 'engage' also, not likely men are going into an enemy with their lances at the 'carry.'" The result of this, with a rear rank but eight feet in rear of their comrades in front, is more disastrous, as has been proved on service, to friend than foe. Therefore, even though we have two ranks in the first line, and even though many of the rear rank eventually find themselves during the last fifty yards alongside their front rank men, it appears better that they should as a rear rank be armed throughout with the sword in preference to the lance. The suggestion that in lancer regiments the rear rank men should sling lances on their left arms and draw swords, is, if anything, I think more dangerous both to man and horse than the serried rank of carried lances in the rear rank at point of impact, and would moreover completely hamper the swordsman and very probably his horse in the ensuing *mêlée*.

The inference that may be drawn therefore is that the front ranks of the first line and supports should be armed for shock tactics, and their rear ranks with the sword, while the reserves and surprise squadrons should also trust to the latter weapon.

Now to divide our cavalry, always and on the field of battle, as required by these arguments, to be able to always place our lancer regiments where lances will be required, and hussars where swords will be most effective, as is proposed by Colonel Neville at the end of his paper on Cavalry Armament, is with our small army, and with the peculiar descriptions of warfare which as a rule we are called on to wage, an absolute impossibility. In a big European war when our cavalry divisions would be we hope more or less intact and organized as required, it might be possible, but for our cavalry work as generally carried out on active service, in Afghanistan, the North-West Frontier of India, South Africa, and the Soudan, where most frequently regiments and squadrons even are working alone, and at all events never in larger masses than brigades, the idea is not workable. The fact is that to meet the peculiar conditions of modern British wars the whole of our cavalry must be able to use both the lance and the sword, and to this end every trooper and sowar must be equipped with, and trained in, the use of both weapons.

Whether against mounted troops, or against formed or scattered infantry, we have found from experiences in Persia, China, Afghanistan, and more recently in the Soudan and the Indian expeditions, that especially when dealing with Oriental foot soldiers armed with sharp cutting knives or tulwars as well as rifles, the lance is a necessity for our cavalry in pursuit, and in shock tactics against infantry, and certainly in shock tactics against the mounted arm.

When the 9th Bengal Cavalry under Colonel Palmer (now Sir A. P. P.) proceeded to the Soudan, they were armed with the lance just before embarkation, and it was only because in tournaments, at drill and tent-pegging, that, although a Bengal cavalry and not a Bengal lancer

regiment, they had been trained in the use of the weapon that they were able to make use of it with the excellent effect they did on the Mahdists in the Soudan when they put their usual tactics; of throwing themselves onto the ground to avoid the cavalry sabres, into force. The men of the 11th Bengal Lancers in the Chitral Campaign, who having either dropped or broken their lances in the charge, were but able to pursue their enemy with the sword, stated that it was almost impossible against that foe and over such ground to inflict any serious wounds, while their comrades who were as a body armed with the lance, spitted the would-be-hamstringers like cocks on a run.

The increase of lancer regiments among our native cavalry some few years back, an increase which is still going on, at first drew many adverse comments from the old school of cavalymen, who, like Sir Charles Napier, considered the sowar a born swordsman, but a feeble lancer. And although it may still be admitted that the Sikh or Mahomedan seldom if ever becomes as expert and as powerful a lancer as the European, still there is no one more than the native sowar (who has seen service) who better appreciates the necessity and advantages of the lance in its proper place, though for the single combat or general *mêlée* he puts his trust entirely in his razor-edged tulwar, with which, and with his peculiar drawing cut, he considers himself a match for any horseman in the world, be he armed with the straight sword of the European dragoon or the lance of the Cossack.

The inference to be drawn from these considerations appears to be that, for our peculiar requirements in warfare, the whole of our cavalry, both European and native, should be equipped with, and trained in the use of, both lance and sword. That as far as possible on the field of battle those ranks only should be armed with the lance that there is reasonable supposition to think will require it. That on the line of march (but not when manœuvring) each man should carry a lance as well as a sword, by which means the calculated percentage of broken and lost lances in the front ranks can be made good.

It is not on the line of march that the extra weight of this extra weapon tells on the horse, in anything like a prohibitive degree, but when manœuvring, and there is no reason why either lancer, hussar, dragoon or native cavalry regiments should during this period encumber themselves with the "*arme de choc*" in their rear ranks; therefore, far from increasing the weight, taking it all round, of the amount carried by our troop horses in peace or war manœuvres, the working out of the principle of using each arm in its proper place and at its proper time would go a long way towards reducing it.

We cannot afford to neglect the sword and the tulwar, which have their own special uses, any more than we can the lance; and although, as will be always the case with our cavalry, we may have particular classes of soldiers who are and will ever be from the nature of their build and national traditions better swordsmen than lancers, we must,

if we intend to meet our peculiar and essentially British war requirements, not only train our cavalry throughout in the use of both weapons, but also equip them with the lance as well as with the sword.

## COAST DEFENSE.

A Lecture Delivered at the Royal United Service Institution.

BY CAPTAIN F.M. LOWE, R. A.

(*Proceedings of the Royal Artillery Institution.*)

THE National Artillery Association has done me the honor to ask me, through the Secretary of the Royal Artillery Institution, to read a paper to you on the subject of coast artillery. It is, however, wisely stipulated that my remarks should generally lie outside the province of the drill-book. The new edition of "Garrison Artillery Drill" is so complete, and enters in every direction so much into detail, that very little is left of the subject which is not dealt with in that manual. This must be my excuse if my paper should unfortunately fail to interest you. I, therefore, come among you without maps, diagrams, and usual paraphernalia of the lecturer, and will simply make it my endeavor to-day to dispel certain illusions or misunderstandings which my experience in the School of Gunnery leads me to believe are not uncommon with regard to coast artillery.

### THE USE OF COAST ARTILLERY, FORTS, AND GUNNERS.

I sometimes hear people, who ought to know better, say, "I do not believe in coast defense," meaning thereby, the fortifying of strategic points on the coast-line of the empire.

I am not infrequently asked, "Of what use is the garrison artillery on coast fronts?" And in these days when so much is read and written about the navy, the question is not unnatural. I hope to be able to answer it satisfactorily.

In a discussion, following upon his lecture on "Coast Defense in Relation to War," delivered before the Malta Naval and Military Society in 1893, Sir George Clarke cleverly compared the usefulness of a coast gunner to a notice that "a fierce dog was on the premises." And he considered that the coast gunner at best is but a deterrent.\*

Admitting for the moment that this description is full and complete, it does not in the least absolve us from exerting every effort to improve our efficiency, for unless the dog is really there and is fierce, the notice board is of little value. Ideal coast defense consists undoubtedly in the possession of an all-powerful navy, competent to watch, shepherd, and account for every ship in the enemy's fleet—for every ship in any combination of foreign fleets that may possibly be pitted against ours.

\* *Vide Proceedings R. A. Institution, November, 1894.*

But, as the French Admiral Bourgois has pointed out, "The weak can sometimes foil the watchfulness and precautions of the strong, and appear unexpectedly on an enemy's coast, and there do much mischief. It is this consideration which makes coast defense a necessity." \*

Recent examples are forthcoming to teach the same lessons that naval history invariably contains. The defeat of the Chinese by the Japanese points to the influence of sea-power on the destiny of nations. Again, the sequel to Admiral Mello's useless destruction of life and property on the coasts of Brazil in 1893 and 1894 shows what must be the eventual fate of a navy, however strong, that does not rest upon safe bases.

Admiral Mello, it will be remembered, had the greatest difficulty in obtaining supplies, carrying out refits, and giving his crews necessary rest during the protracted struggle. But one fort in Rio Harbor supported his cause, which was, as may be supposed, upon an island, and therefore, for purposes of supply and repair, little better than a large ship.

Ashore Marshal Peixoto's forts and garrison gunners served their purposes, although they appear to have been indifferently armed and provided with any ammunition that could be got hold of.

Marshal Peixoto gained time to get together a fleet, and, although this fleet was an incongruous collection of vessels manned by scratch crews, its appearance off Rio, backed up by the forts, practically put an end to the civil war.

This, then, is the true function of our coast fortresses—to hold the strategic bases of the navy, if attacked, until naval relief is forthcoming; and, in the words of an experienced naval officer, Captain Martin Leake, written in 1728, concerning the Portsmouth forts, "Secure our Navy and a good harbor." † And this duty will have to be carried out, not only for the Royal Navy, but for the Mercantile Marine. To the navy belongs the duty of keeping open the highways of the ocean to the vast trade of the empire, valued in a recent parliamentary return at over 954 millions a year. ‡ To the army, with the coast artillery as the pre-eminent arm, belongs the duty of securing the shore ends of the great trade route. Sea-borne trade is the life-blood of the empire, and its circulation must be maintained, or collapse and demise will result. The United Kingdom must be supplied with food from across the seas. Even if a sufficient store of food is kept up in England for any definite period, the people must be able to earn wages wherewith to purchase it; and to enable them to earn wages raw material must be imported without great difficulty, and the manufactured article exported with equal ease.

Besides the duty of fighting the heavy guns in coast forts, there are other ways in which the garrison gunner will find employment.

\* "Les Torpilleurs, la Guerre Navale et la Defense des Côtes," p. 215.

† "Life of Captain Stephen Martin," Navy Records Society, p. 213.

‡ Navy (Sea-going Warships, etc), d. Admiralty, 3d September, 1895.

In times of war, orders and regulations for the management of the traffic of shipping entering fortified ports will be framed to meet the requirements of the war in which we may be engaged.

The duty of enforcing these regulations will fall upon the garrison artillery. It will be an arduous and irksome duty, and inglorious, if duty may ever be so qualified. It is a duty that must be provided for and cheerfully performed. The most important detail in the garrison artilleryman's work in war will be to look out for and repulse torpedo-boat attacks. There is little or no war experience to show how far forts will be able to deal with this comparatively new form of raid. The experience gained at Wei-hai-wai is, as far as it goes, in favor of the fort *versus* torpedo boat, but it is not enough on which to base opinion, for until the forts commanding the entrance to the harbor of Wei-hai-wai were in the hands of the Japanese army, and presumably also the shore search-lights and mine fields, Admiral Ito would not venture a torpedo-boat attack. And it is interesting to note that the Japanese in the forts completely frustrated the torpedo-boat attack on the night of the 30th January by opening fire on their own boats from the forts, mistaking them for Chinese. Surprise being an essential element in such an undertaking, the mere betrayal of the presence of the attacking flotilla was sufficient to send it back to the fleet. Discretion proved in this case the better part of valor, though no one can say that the crews of the Japanese torpedo boats were wanting in the latter virtue. It is in the direction of repelling such raids that the principal training of garrison artillery must eventually tend. More than ever will it be necessary for smart drill and quick laying, and this not only in daylight, but at night. The men, to repel a torpedo-boat raid, must obtain what Nelson defined as "trained dexterity, acquired by the mere habit of doing things in the dark and under difficulties." The laws which govern torpedo-boat attacks will be probably not unlike the conditions that attended successful cutting-out expeditions by the boats of the fleet in former wars. The details will be changed, but the principles will probably remain unaltered. Naval history relating to such expeditions will, therefore, help us to realize what our duties in this respect will be.

The guarding of booms and of mine fields, where they may be found necessary, will also fall to the lot of the garrison artillery; but here infantry would probably assist, and be of great service. Therefore, in every way in which our navy, our merchant fleet, and a good harbor may be secured the garrison artilleryman comes to the fore. He appears to me to be more than a watch-dog, and if similes are convenient and desirable, I would rather liken him to the goal-keeper in the football field, whose duties need no explanation to an Englishman. I would, however, be quite clear on this point—no amount of coast artillery will ever afford a substitute for a single man-of-war.

The true estimate of the relative value of ships and forts is strikingly and aptly illustrated by the action of the Earl of Sussex, who was

Warden of Portsmouth at the time of the threatened invasion by Spain. To quote his own words in writing to Walsingham, July 26, 1588: "I have sent enclosed a letter from my Lord Admiral, which I received at six of the clock this morning, wherein he writeth for powder and shot, and saith he hath very great want thereof, by reason of three great fights which he hath had with the Spanish fleet. Whereupon I have sent him so much as that I have altogether unfurnished myself, which I shall desire your Honour to be a means that it may be supplied, for that I shall have great want thereof if any attempt be offered."\* At six in the morning he heard the fleet was short of ammunition; he immediately cleared out his magazines, and sent all his powder and shot away to the ships, leaving Portsmouth defenseless, and then wrote to London for fresh supplies, not only for himself, but as a further reserve for the fleet. He finished his letter by hoping that when writing again he might be able to send "some certain news of good success," thereby showing that possibility of invasion was still before the country when he stripped the defenses of Portsmouth to supply the fleet. Again, if fortifications afford a sense of security to a nation (the Royal Commission of 1859-63 is a case in point), and if public opinion is prevented by the existence of forts from interfering with the direction of the movements of the fleet, then forts and gunners will indirectly prove of still further value to a maritime empire such as ours.

Possibly, had the coasts of England in Queen Elizabeth's reign been comparatively as strongly fortified as they now are, Lord Howard of Effingham would not have been kept in the Channel against his will, and the Spanish Armada would probably never have seen the English coast. He wrote on June 14, 1588: "The opinion of Sir Francis Drake, Mr. Hawkyns, Mr. Frobisher, and others that be men of greatest judgment and experience, as also my own concurring with them in the same, is that the surest way to meet with the Spanish Fleet is upon their own coast, or in any harbor of their own, and there to defeat them." Again he wrote: "The seas are broad, but if we had been on their coasts they durst not have put off to us on their backs." But he adds, "I must and will obey, and am glad there be such there as are able to judge what is fitter for us to do than we here."\*

The same idea is contained in Captain Mahan's "Influence of Sea Power on History." "There is a view of defense," he says, "which asserts that safety for one's self—the real object of defensive preparation—is best secured by attacking the enemy. England defended her own coasts and colonies by stationing her fleets off the French ports to fight the French fleet if it came out." Let us hope that existing forts may have this effect, and that public opinion will not again court disaster by localizing fleets.

There appears to me to be another possible use for the garrison artil-

\*"Defeat of the Spanish Armada," Navy Records Society.

lery, one for which I hope necessity may never arise. It is a use that does not constitute a reason for the existence of the coast gunner, but it may well be reckoned in estimating his worth. Should the fleet ever be short of men to man the guns afloat, would not the garrison artillery form a useful reserve of disciplined and drilled men from which to draw? There will be no press-gang in the future. If the fleet is not properly manned, there is no use in keeping men in forts who might be of service afloat. As facts of the past help us to forecast the possibilities of the future, a few instances, taken at random, of the part that has been played by artillerymen afloat, will not be out of place. Before, and for some time after, the days of Queen Elizabeth the gunners afloat and ashore were under the control of the Master-General of the Ordnance, and were apparently borne on the same lists. There is extant a curious letter from Master-Gunner William Thomas, of the garrison of Flushing, written soon after the defeat of the Spanish Armada, which points to the fact that the principal man behind the gun was the same afloat and ashore. In this letter it is urged that if the petition of the gunners had been granted in former years, and if they were established on a firmer basis, as in the reign of Henry VIII., there would have been less "blind exercise and unskilful teaching," and the gunners would have shot straighter than they did at the Spanish ships. "So much powder," he writes, "and shot spent, and so long time in fight, and, in comparison thereof, so little harm." \* It is not in human nature that Master-Gunner Thomas, a garrison gunner, would thus excuse the bad shooting of gunners afloat unless he and they were of the same corps. In latter days, and well into the beginning of the present century, Royal Artillery served afloat in the bomb vessels. Admiral Boscawen, in the East Indies, thought so much of his Royal artillerymen that he wished to have the promotion of the officers in his own hands. † Lieut. Thomas Davies, of the artillery, in one of the vast inland seas of North America, actually commanded a naval force at the time of the conquest of Canada. ‡ It is recorded that he took a French frigate of eighteen guns after a close action of nearly three hours. Sir Thomas Blomfield, of Copenhagen fame, as a Royal Artillery officer served under Rodney at the bombardment of Havre in 1759. § His experience afloat served him in good stead afterwards in fitting out floating batteries on the Canadian lakes.

Lieut. Robertson, R.A., with some gunners, served under Nelson on board the *Victory* in 1805, but was not fortunate enough to be at Trafalgar. † Similar instances could be quoted without end. There is nothing new in the idea of Royal Artillery serving afloat, and it is worthy of note that such service was popular with gunners.

I have no real difference of opinion with Sir George Clarke on the subject of coast artillery; it would indeed be presumptuous if I had. I only

\* "Defeat of the Spanish Armada," Navy Records Society.

† Duncan, "History of the Royal Regiment of Artillery."

‡ Kane's List.

think that he does not give the coast gunner sufficient credit. Professional zeal prompts me, for reasons I have given, to consider that the functions of garrison artillery in war is something more than "deterrent." Having regard to the change in Continental armies since the days of Waterloo, and to the conditions upon which rest the safety and existence of the empire, I hold that our army does not contain a service of greater importance than the coast artillery.

COAST FORTS SHOULD BE MANNED BY THE ARMY, AND NOT BY THE  
NAVY.

Now as to the manning of forts, there is a widespread and curious theory that admits the usefulness of coast forts, but considers that they should be evacuated by the garrison artillery, and handed over to the navy and manned by sailors. If this were to happen, the actual working of the forts would no doubt be well done, as sailors' work invariably is, but this is not the only point to consider. When a naval base is attacked history shows us that, with few exceptions, the serious attack is directed on the land front. This attack may or may not be supported by a bombardment of the forts on the sea-front. A field force must be ready to render the assault abortive, either by direct conflict or by threatening the rear and communications of the attacking force; and if the attack is pressed home, the land fortifications should be able to hold out until relief is brought. Now, unless the advocates of sailors in coast forts are prepared to hand over, together with the coast forts, the land forts and field force of the fortress to the command of the Port Admiral, there will be a dividing line of authority inside the fortress, somewhere between its sea and land front. The fortress will be cut in half; surely neither one nor the other alternative is desirable. No, the function of the fleet is clear. Its *locus operandi* is on the sea. The function of the army is equally as distinct, and its duties are ashore. Nature has provided a boundary fence between them; it is called the five-fathom line. Here and there, there may be—there must be—some overlapping to make the joint good. Where such is the case let the naval voice, by all means, in a naval nation be supreme. Captain Mahan, of the United States Navy, has once and for all laid down a definition difficult to disprove. He points out, in his "Influence of Sea Power on History," that there is "much unnecessary wrangling as to the proper sphere of the army and navy in coast defense. Passive defenses belong to the army, everything that moves in the water to the navy;" and in a previous paragraph he defines passive defenses as "fortifications, submarine mines, and generally all permanent works destined simply to stop an enemy if he tries to enter a harbor."

"If seamen," he continues, "are used to garrison forts, they become part of the land forces, as surely as troops, when embarked as part of the complement, become part of the sea forces."

There is an expression in common use with regard to the sea and land

forces of which we have recently heard frequent mention. I allude to what is called the first and second line of defense. It has always appeared to me that this term is not only inaccurate but misleading, and therefore wholly undesirable. If my judgment is correct, then, for national defense, and for all purposes where joint action is necessary, the navy and army are as one. They stand or fall together. It is only necessary to remember that their individual duties are different.

Since I wrote the above I am pleased to find the same idea has been expressed by an abler voice than mine.\* But in this connection let me beseech you not to think or do or say anything that may tend to create or foster a spirit of jealous rivalry between the two services. There is no tug of war between the navy and the army; we are both on the same side of the rope. You who are so skilled at shifting ordnance know the value of the word of command, "Taut, together heave," and in any apparent difference in naval and military opinion remember we must all "heave together."

#### GARRISON ARTILLERY DRILL IS NOT UNNECESSARILY COMPLICATED.

It is frequently said that coast artillery drill is too complicated. Those who, for the first time, take up the subject of coast artillery are often unnecessarily alarmed by the various figures and formulæ that confront them. Objections are raised to the following effect: That to comprehend the various calculations a man must be an advanced mathematician, and that, even when able to grapple with complicated sums and tables, he could not be expected to do so in the heat of action. In short, the complete coast artilleryman is often, by a process of unnecessary exaggeration, likened to a creature such as Shakespeare must have had in his mind when he wrote, "A braggart, a rogue, a villain that fights by the book of arithmetic."† No one expects sums to be worked out in action. The object of all you read in your Drill Book is in order to accustom and train your mind at drill, and at peace practice to what time of flight and a moving target really mean. Thus when the day of action comes you will instinctively know what is required to be done in order that your projectile and target may meet.

It is wonderful how soon our range-finding specialists acquire the power of accurately estimating the speed of a ship from constant practice in measuring it. Similarly, coast artillery officers, and especially those who will have to act as battery commanders, should, by constant practice and application of the rules and tables furnished to assist them, be able instinctively to arrive at accurate data for successful shooting.

Tables and formulæ are poor substitutes for the experience of much practice, but until we get a larger allowance of ammunition to fire, and even if that allowance could be made sufficient to our wants, they are of undoubted assistance, and should be carefully used accordingly.

\* Admiral Colomb.

† *Romeo and Juliet*, Act III, Sc. 1.

The reason for the apparent complication in fire discipline of coast artillery is that for service practice we have abolished standing targets, sighting shots, and signalling errors by a range party, as useless in preparation for war under modern conditions. The standing target has done its work, but the time has come to put it away with the bows and arrows with which it had its origin. All our efforts are directed towards obtaining faster and still faster targets.

We read that at Wei-hai-wai the Chinese gunners in the forts, at ranges of 2400 yards, were unable to hit the Japanese vessels moving at a high rate of speed. It is a lesson for us all that we should do well to lay to heart. The difficulties of making good practice at a really fast-moving target have not, I fear, been thoroughly appreciated. Let us hope that when we first realize these difficulties it may be at peace practice, and then only to overcome them. Every device that may possibly assist us in this direction should be welcomed and used, especially those contrivances whose action is automatic.

In cases such as that instanced by Wei-hai-wai, ranging, as we know it, is out of the question. A ship crosses the sector of fire so rapidly under service conditions, that if we could get off two salvos at the same craft we should be lucky. Abroad this has been recognized, and means are provided to enable a battery commander to estimate with fairly accuracy how many salvos he would be able to get off at the same target as she crosses his sector of fire. If it comes out a doubtful two, he keeps his fire until the ship arrives at the shortest range, where the effect of his one salvo will be most likely to be accurate and effective.

*We want quick-firing, high-velocity guns of medium and small calibre, fitted with automatic sights where possible, and in all cases the sights should be so arranged that the gun-layer is clear of the loading numbers and recoil, and can follow his target during the operation of loading.*

(The best material is, however, of little use unless the personnel is perfectly trained in its minutest detail.) We further want a good B.L. howitzer of nine or ten-inch calibre for high-angle fire; we want faster targets and smarter drill.

Everything in these days tends to pace. Of late we have read quotations from *King John* that are no doubt very apt and desirable in that they are patriotic.\* If, however, we must quote from that play, let us say with "Philip," "The spirit of the time shall teach me speed."

It cannot be insisted upon too much that the difficulties in solving the problem of good practice at fast targets are very great—greater, perhaps, than many have imagined who have given the subject thought. Where difficulties are great the means to overcome them are not usually simple. We must face the difficulties, and by constant drill and practice become familiar with the various rules and methods that the drill

\* *Vide Funch.*

book gives. To do this it is not necessary to be a mathematician, as some aver. Coast artillery fire discipline is now, owing to these conditions, an art that cannot be taken up one day and dropped the next. It is a special study.

On the other hand, there is no doubt a tendency, observable in all undertakings, of clever men to elaborate. In their great zeal they are apt, in perfecting the means, to forget the end, or rather, perhaps, to mistake one for the other.

The framers of our coast artillery drill have not escaped the charge of complicated methods. Those who lightly bring this charge cannot have realized the difficulties to be dealt with. It is noticeable, too, that they rarely suggest a satisfactory and simple substitute for that with which they find fault. Let me assure you the authors of the drill book have made it an object to simplify drill in all its details, and to make every accessory appliance as automatic as ingenuity can devise or experience suggest. Here we should bear in mind that in our many and in-consequent units lies an inevitable hindrance in the way of simplicity. We have to deal with inches, feet, and yards, and in addition the deflection leaf has two quite unnecessary units—degrees and minutes. Between them all it is not to be wondered at that difficulty sometimes arises; and we can well congratulate our Continental neighbors who use the metre and its decimals for all purposes of linear measurement.

Once more to revert to the lesson of Wei-hai-wai. We are told that "the state of the garrisons (of the forts) was indeed hopeless, for the men had no drill beyond the mere loading and firing of their big guns. They had no night exercises, nor instruction in any kind of night signals, and were entirely ignorant of any kind of emergency duty; in short, neither officers nor men had an idea beyond the working of their guns.\* If we are to be of use, if we are to be truly "efficient," we must do better than the Chinese coast artillerymen.

#### HIGH V. LOW SITES FOR MOUNTING GUNS.

As to the advantages of mounting guns on elevated positions, Sir George Clarke, in his valuable work on "Fortification," says: "It is always desirable to mount guns upon high sites when possible. The teaching of the Wasp and Telegraph batteries at Sebastopol was sufficiently clear, but, on account of some strange misunderstanding of ballistic laws, this teaching is only now beginning to bear fruit." I fear the harvest from this tree is not at present bounteous. I find on all sides the strange misunderstanding of ballistic laws only too prevalent. As the question of value of height is but little referred to in the drill book, I will endeavor to point out to you in detail some of the advantages it offers.

General Richardson has admirably summed up the value of a high site in one short sentence: "On heights less protection is needed, the

\* *Blackwood*, November, 1895.

guns cannot so easily be rushed by landing parties, their practice is better, their target is always larger, while they are difficult objects for a ship to hit."\* Colonel Jocelyn † has proved General Richardson's statements analytically for us. In spite of history and the efforts of those distinguished officers whose names I have quoted, it is not easy to make some otherwise good gunners believe in these important truths. This year the garrison artillery stationed at the principal coast fortresses will compete in their prize firing for a cup that has been generously given for the purpose by our Deputy Adjutant-General, who occupies the chair this evening. (Cheers.)

Naturally, every endeavor will be made to secure the best advantage in this competition.‡ I fear that a general scuttle down-hill will result, and with the best intentions the guns nearest to the level of the sea will be used where possible for the competition. The argument used in favor of low sites is, I believe, the following: It is admitted that when you have a ship for a target, then the high site has the advantage, because beam is greater than freeboard, and as you ascend the target becomes larger. With practice targets that are freeboard, without beam, the case is reversed, and the low site presents undoubted advantages. I shall endeavor to prove to you that the low site does not possess this advantage claimed for it.

To return to the advantages of a high site, there is the advantage of look-out. On p. 488 of the new "Garrison Artillery Drill," you will find it stated that ships coming in at 14 knots will be within range in less than half an hour after their having been first sighted. This means that the ships were not sighted until they were within about eight or nine miles of the coast, and consequently the supposition is that the fire commander's station is on a low site. Let me recommend you to note in the margin of your books that water-line in miles  $= \sqrt{\frac{3}{2}} \times \text{altitude in feet}$ . That is to say, the water-line of a ship can be seen so many miles distant from the eye of the observer when he is so many feet above sea-level. Smoke from a squadron under way would be noticed long before the water-line of the leading ship could be seen. Off the mouth of the Yalu the Chinese saw the smoke of the Japanese fleet an hour and a half before the Japanese made out the Chinese.

From the top of a cliff 600 feet high the water-line of a vessel is observable up to 30 miles, and smoke, say, 10 miles further still. This may be, and is, an extreme case, and means clear weather and a good glass. But it is worth considering in connection with the drill book statement. In the case of an observing-station 600 feet high, you get over two hours' notice in place of the drill book's "less than half an hour," always supposing the same conditions, and 14 knots speed.

\* *Proceedings Royal Artillery Institution*, No. 1, Vol. 20.

† *Proceedings Royal Artillery Institution*, No. 4, Vol. 20.

‡ The company which eventually carried off the Deputy Adjutant-General's cup fired from a site 160 feet above sea-level.

"Less protection is needed on a height." The flatter the trajectory of a gun the less will be the angle of arrival, and with modern guns at short ranges the angle of arrival of projectiles on the parapet of a high site fort will in many cases be one of ascent. Little or no harm to the fort will result. At the passage of the forts of Vicksburg and of Port Hudson, on the Mississippi, the moderate height of about 100 feet was sufficient protection for the guns, while the low-site water batteries suffered severely. High sites compel ships to fire at long ranges if they want to do harm, and then inaccurate fire is likely to result; and remember that as the muzzle velocity of modern guns increases, and the trajectories of modern projectiles become flatter, so does the protection afforded by a high site become greater.

"The high-site battery is not so liable to be rushed by landing parties." The fate of the inner defenses of Vera Cruz, captured by seamen of the French fleet in 1838, is an example of the danger to which a low site work is exposed in darkness and fog. It is obvious that height renders the success of such an exploit less feasible. On a smaller scale may be instanced the unsuccessful attack on the French forts in the island of St. Martin in 1808. The landing party obtained possession of the low-site fort and spiked the guns, but were unable to reach the high-site forts, and so the attempt failed. The corollary to this is that the high site fort may be of cheaper construction than that at the water's edge.

At the close of the French naval manœuvres in the Mediterranean in 1893, the fleet carried out some interesting experiments in firing at a high site.

The target was on the top of Cape Rosso, on the west of Corsica, probably one of the ruined Genoese towers so common on that coast. Six battle-ships opened fire, while one was told off to observe its effects.

The range was first 8750 yards, and speed 10 knots; the guns were 6.3 inch and 5.5 inch. The range was afterwards reduced to 3800 yards, and guns of all calibres were used, and the speed maintained at eight knots.

Three of the ships subsequently went back to the first range, steaming a course on the arc of a circle of which the target was the centre. The results are reported to have been not very satisfactory from the ship's point of view. This experiment affords another instance of the value of a high site, and is supplementary to our own experiences at Inchkeith and Portland, that tell the same story, but with older ordnance.

The principal lesson to be derived from the Inchkeith experiments is, that it took over 15,000 rounds of machine-gun fire to score 15 hits on dummies representing a gun detachment in unnecessarily exposed positions. The conditions were most favorable for the ship in every respect except that the target was on a high site.

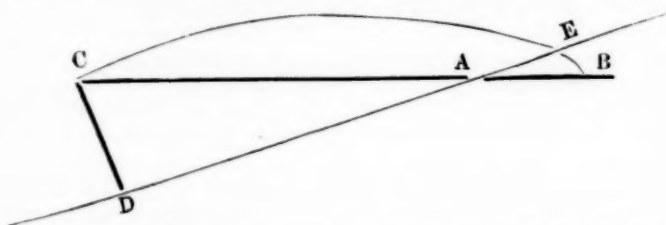
"The target is always larger from a high site." This, I think, will

not be disputed. As we ascend a ship looks larger to the eye, and a moment's consideration will show you that from a height the target offered to the projectile as it approaches it, is still larger than it is to the eye.

The remaining advantage claimed for a high-site battery by General Richardson is that the "practice from it is better." The fact in itself constitutes protection. Again, to quote Captain Mahan: "In the struggle to multiply gun shields and other defensive contrivances \* \* \* there is now a tendency to undervalue \* \* \* a leading principle in warfare. The best protection against the enemy's fire is a well-directed fire from our own guns."\*

Let us now consider how height affects practice against a target such as we use, that has only length and freeboard, and is without the third dimension of beam. Lateral errors do not concern us in this investigation, as height does not affect direction.

Throughout your drill book you will find enumerated the various disturbing causes that affect the range. It does not particularly matter what the cause of error in range may be, but suppose our target is at A, we are firing from C, a low site, and for some reason the shot strikes



at B, an error of AB. Now assuming the theory of rigid trajectory, which is practically true for small angles, let us suppose C on a height, and the round is repeated under exactly the same conditions; DA being now horizontal, the shot will strike at E, an error equal to AE. or less than that when firing from a low site. To take an actual example—8 oz. of powder added to the full charge of the 9-inch R.M.L. gun will increase its muzzle velocity about 8 feet per second (and I fear that variation from correct weight is not so uncommon as it should be). This increase of velocity on the flat means an increase of range of 30 yards in 1700. At a height of 250 feet above the level of the sea this error is reduced to 20 yards—a very considerable reduction. For the sake of argument, let us suppose that we have perfect guns and ammunition, and accurate range-finding arrangements, and that the guns shoot exactly in accordance with the range table. Now, suppose one gun is in a fort 250 feet, and the other at a height of 29 feet above the mean level of the sea. These heights have been taken because they

\* "Life of Farragut," p. 218.

represent the heights of forts actually in existence, that need not be named. It is manifest, under the conditions, that when the gun is fired we hit or miss the target according to whether the gun is inclined at the correct angle or not to the horizon, the line being supposed to be correct. Further, there is a limiting angle of elevation between that necessary to strike the water-line and that to just graze the top of the target. Our targets are 12 feet high, so with the 9-inch guns this limit, which may be called the "permissible error in elevation," is a very appreciable quantity. If you take the trouble to make out a table of quadrant elevation for the high site and for the low site, reading to minutes and yards, and also make out a table of permissible errors in range for the high and low site, you will find that, although the actual permissible error in range from the high site is less than from the low, the permissible error in elevation, the cause over which we in the fort have control, is the same in both cases. That is to say, for a 9-inch gun firing at 1700 yards, the permissible error in elevation is eight minutes from either site, when firing at a target such as we have supposed; but the permissible error in range is, for the 250 feet site, 39 yards, and for the 29 feet site it is as much as 65 yards; or, in other words, you can make a mistake of eight minutes on the 250 feet site, and only get an error of 39 yards, whereas the same error on the 29 feet site gives an error of 65 yards, getting on for double the former amount. This is where the fallacy has crept in—the effect has been considered without giving due consideration to the cause.

The true comparison to make is, how far will the same error in elevation affect the same gun on a high and a low site? You will find practically no difference as regards the target without beam, but as the scale by which the elevation is given is more open, and therefore easier to read the higher you ascend, the chances are greater that the correct elevation is given to the gun on the high site.

This will show you that the range tables issued for each gun only furnish (as far as six columns out of thirteen are concerned) the necessary data for you to reconstruct range tables suitable for the peculiar height at which your gun is mounted. Remember that the range tables are made out for target and gun on the same level, and that directly you fire at a target lower than your gun, then much of the data given in the tables requires modification. Take the 9-inch gun as an example. The range table tells you that on the flat five minutes' elevation at 1700 yards makes a difference of 47 yards. Take the gun up only 100 feet, the difference is reduced to 34 yards, whilst at 250 feet the difference is 20 yards. Even 29 feet reduces the difference by 7 yards, 40 instead of 47.

Again, on page 57 of your drill book, you must suppose the statement to refer to a very low site indeed (which, fortunately, is the exception rather than the rule). It states: "If there is a difference of level in the racers of five minutes between trail extreme right and extreme left, this would mean, with a 9-inch or 10-inch gun, a difference of 50

yards at 1500 yards range." At a height of 250 feet the error in range caused by five minutes' irregularity of racer would be less than 16 yards in 1500.

For this reason you can easily imagine that correction of fire is easier on the high site for gunnery reasons alone. Racer and tide corrections tend to disappear, and what is called, with great unfairness to the ammunition, "the powder correction," becomes less, and proportionately the chance of error in giving it ought to be reduced. I understand that it has been necessary, when practising from some of the high-site batteries at Gibraltar, to increase the range beyond the usual limits, in order that the target may not be destroyed each round. It is only a repetition, with modern guns, of Lieut. Koehler's experience with S. B. guns and his depressing carriage during the defense of Gibraltar in 1782. Drinkwater, the historian of that memorable defense, records that "as to the accuracy of the depressing shot, no further proof need be adduced than that out of 30 rounds 28 shots took place in one traverse of S. Carlos battery."

It will not, I think, be questioned that observation of fire (an important factor in shooting when ranging is possible) is easier and more accurate from a height, so that advantage need not be dwelt upon, but simply scored to the credit of the high site.

The most important advantage of height is, perhaps, the help it gives us to ascertain ranges. You have, I understand, now been supplied with the depression range-finder, and are already acquainted with the very great value of the little instrument. If you take the trouble to investigate the principle of its working, and compare its working on a high and low site, your pains will be amply rewarded. Taking an average of the ranges between 1700 and 1800 yards, you will find that an error in the instrument (whether through defective adjustment or faulty manipulation) of one minute at 48 feet above sea-level makes a difference in the recorded range of about 56 yards at mean tide. Supposing a rise and fall of six feet, at high water this error would make a difference of  $64\frac{1}{2}$  yards, and at low water of about 50. At a height of 250 feet the tidal differences practically disappear, and the error of a minute corresponds to one in range of just less than ten yards. The advantage here of high site is enormous. When you consider the serious consequences on a low site of an error so small that the bubble of an ordinary spirit-level is only just moved by it, then you realize the advantage of a high site if from no other than from the range-finder's point of view.

In your drill book, on page 57, the advantage of a high site in automatically correcting small errors in range is pointed out. Abroad height is utilized to a further extent, and it is to be hoped that we may soon follow the good example. Automatic sights are provided; that is a system of sighting by means of which correct elevation is automatically given by laying on the target. Such sights are not intended to supersede range-finders, but to supplement them at shorter ranges. It is ob-

vicious that the range at which an automatic sight can be used with accuracy depends entirely on the height of the gun above sea-level. There is no reason why all guns mounted at 200 feet and over above sea-level should not make very fair practice at average ranges, say, up to 4000 yards, if fitted with automatic sights, and at the same time be independent of range-finders. Here in itself is a sufficient reason for the preference of a high site. Range-finders and their adjuncts may fail at a critical moment, and the knowledge that there is a reliable automatic sight to fall back on, should such disaster occur, will, I know, be hailed with delight by all who have had experience in the modern conditions of coast artillery fire.

Sir George Clarke has instanced the value of high sites by experience in war in the Black Sea. Without leaving the same waters, we can learn the same lesson by preparations in peace. At Batoum the old Turkish low-site forts have been strengthened and re-armed by the Russians. But the strength of the place consists in two new forts, 300 feet above sea-level, overlooking the harbor and skilfully concealed. To obtain this height about 700 yards of range was necessarily sacrificed, but the manifest advantages more than counterbalance the minor drawback.

A slight sacrifice of range on a high site is inseparable from the conditions. In the case of quick-firing guns intended for use at night or in thick weather, every yard is of advantage to bring the gun as near as possible to its target for the purpose of being able to see it. I would, in selecting a site for a gun to be used under these conditions, choose a position as near to the channel to be defended as possible, consistent with sufficient height to enable the use of an automatic sight possible at all probable ranges. You have to balance two considerations: It is of no use mounting a gun where you cannot see your target, nor is it of use mounting it in such a position that you can see but cannot hit your target with certainty. Let me warn you against the erroneous but common idea that the trajectory of our B. L. guns may be taken as flat for 2000 yards, and that quick-firing guns should be mounted but little above sea-level for this reason; and that fire should be directed from them from 3 to 7 feet above the water-level for the purpose of repelling torpedo boats. Take the 12-pounder quick-firing gun for instance. At 2000 yards the maximum heights of its trajectory may be taken roughly as 64 feet. The gun must be some feet above high-water mark to start with, so that at mean tide, at somewhere about 1000 yards, projectiles would be at least 70 feet above the water. Therefore the prospect of sweeping the area commanded by guns so mounted at the elevation for 2000 yards is not promising.

I know that low sites for quick-firing guns have been recommended by officers of great weight and authority; the importance of the question must be my excuse for respectfully opposing my opinion against theirs. Perhaps the term "flat trajectory" is partly responsible for the ideas that exist with regard to low sites. The term is misleading, and must

be regarded as comparative. The French consider the point so important that their range tables contain a column giving maximum heights of trajectory for each range—a most useful aid, from a gunnery point of view, in arriving at an estimate of a gun's capabilities.

It is not, therefore, surprising to find in the Report of the School of Gunnery for 1895 that when the courses under instruction practised from a high site, accuracy in firing improved. The value of a high site, to be truly appreciated, must be experienced, and it is to me a matter of regret that the N. A. A. should invariably carry out their practise from the lowest site in England. For this reason, and for others that do not come within the scope of my lecture, I, for one, should like to see the N. A. A. changing rounds and practicing at a different fortress each year, and from those guns that in time of war the volunteers would have to man.

The opportunity of visiting the dockyards, and there seeing what ships of war look like, would form a useful portion of the instructional advantage of the annual camp. "The science and practice of artillery" would thus be not only "advanced and promoted," but the volunteers would be at the same time made familiar with their places of mobilization.

There are, no doubt, many difficulties in the way of such an arrangement as I propose. But that the principle is sound I know from experience. In 1893 it was my privilege to assist at the meeting of the Artillery Association of the Dominion of Canada, and I can testify to the advantages of getting the auxiliary forces into the forts arranged by that valuable association then for the first time. Since 1893 the system has, I understand, been extended with still greater success.

In conclusion, I would recommend you to study your new drill book firstly, and after that Naval History. I read somewhere lately that English people are not a history reading race, and that not nine people in ten know the date of the battle of Trafalgar. Any other nation but our own would probably make its anniversary a public holiday in perpetuity. So perhaps, therefore, even the study of attacks upon territories will not be a congenial pursuit to you. Nevertheless, I recommend you to take up this form of literature. Begin with Admiral Colomb's "Naval Warfare"; once started you will go on. Do not confine yourselves to English books, but endeavor by reading foreign works "to see ourselves as others see us." Many of you are members of this Institution, and can have access to its magnificent library. To those who are not members I would say: "It is never too late to mend."

One suggestion more: The Institute of Electrical Engineers is, I understand, doing a good work in registering those of their members who are willing, for the purpose of national defense. In Australia, I believe, a corps of electricians exist, and no doubt is most useful. It occurs to me that you must have in your ranks many valuable men who, perhaps, are not members of the Electrical Engineers' Society,

and whom that society cannot reach. If registers are kept in every corps of volunteer artillery of men who possess any description of electrical knowledge, they would be of infinite use to the service of coast artillery on mobilization. Very possibly such lists already exist. If they do not, let me beg you to give their formation your earnest attention.

---

Admiral Colomb and Colonel Sir George Clarke, K.C.M.G., etc., were kind enough, not only to send me the following remarks, but also to allow them to be published in the *Proceedings of the R. A. Institution*.—F. M. L.

Admiral Colomb wrote (July 10, 1896):—

"I am pleased to find in your lecture so close an agreement with the views I have always put forward. I do not see much difference between us on any point, and I trust we have both got hold of the right end of the stick. I am particularly glad you drop on that most mischievous phrase 'the Navy is the first line of defense.' You will see that in the last paper I read before the United Service Institution \* I specially attacked the phrase. I have always denounced it. The navy and the army, as you put it, are as one in the matter of National Defense—they stand or fall together. The army has but to take care not to waste its money by trying to do, as it were, over again, what the navy has already done. Its money should be used only in doing what the navy cannot do.

"A certain amount of Coast Defense is a necessity, but it requires to be kept well within the mark; it must be understood that it works with the navy, and not 'in the absence of the fleet,' as the phrase goes. Absence of the fleet at the moment may always be calculated on, but if all things are as they should be, its presence, as far as may be necessary to defend, may be equally calculated on."

Sir George Clarke wrote (June 10, 1896):—

"Do not forget that I think and meant to say that, 'the dog' ought to be very 'fierce,' always on the spot, and always ready with his bristles up, which he is not invariably at present. I think that it is a disadvantage to have too many dogs spread about over miles of coast. They are apt to become less fierce thereby, and certainly less ready to bite. Also, it seems to me to be still more disadvantageous to put up a number of notices, and to keep too few dogs. But you must not think I do not 'give the coast gunner sufficient credit.' I have had to do with coast gunners for about fifteen years, and I do not think any other branch of the service has made half as much progress in this time.

"But except against torpedo-boat raids, which might be attempted against a few of our ports, I fear that the coast gunner—the British coast gunner—cannot expect in war to find any more employment at his special trade than he did in the past, and this was not much.

---

\* The paper to which Admiral Colomb refers was published in the *Royal United Service Institution Journal* of December, 1895. Every artillery officer who has not read it should do so.

"The great siege of Gibraltar is the only important instance I can recall, and here the coast gunner did his duty admirably and proved more than a match for his assailants. In spite, however, of the immense defensive advantages of the Rock in the eighteenth century, the coast gunner could not have saved it, if great naval efforts for its relief had not been successfully put forth.

"For all that, he is absolutely necessary to the British empire. It is his misfortune that, in proportion to his known efficiency, his prospects of fighting with his own weapon diminishes; because his menace is so great, and ships—his only assailants—are now less than ever fit for a task which lies quite outside their proper rôle.

"There is no parity of conditions. It is the business of the coast gunner to sink, disable, or drive off the ship, and he is specially trained, equipped, and circumstanced with a view to attain this object. It is not the business of the ship to attack the coast gunner, and she is not in any way prepared for the task. To permit her to undertake it, is like employing cavalry to attack infantry behind earthworks. This has actually been done; but like the charge of the Light Cavalry Brigade at Balaclava, it certainly is not war.

"I do not, of course, forget that, as at Kinburn, craft specially constructed with a view to oppose the coast gunner, have been occasionally employed, but I do not see how our enemies can make use of such craft until our star has set, and then these measures will not be in the least necessary."

## Military Notes.

---

"THERE IS A RANK DUE THE UNITED STATES AMONG NATIONS, WHICH WILL BE WITHHELD, IF NOT ABSOLUTELY LOST, BY A REPUTATION OF WEAKNESS. IF WE DESIRE PEACE, ONE OF THE MOST POWERFUL INSTRUMENTS IN OUR RISING PROSPERITY, IT MUST BE KNOWN THAT WE ARE AT ALL TIMES READY FOR WAR."—*George Washington.*

# HABANA y su BAHIA

*Por el Comandante de Artillería.*

**D.F. J.de Moya**

**Escala  $4\frac{1}{0000}$**



From "*El Memorial de Artilleria*," Madrid.

## BRITISH ARTILLERY ORGANIZATION.

THE announcement recently made in several papers that it has been decided to reorganize the Royal Artillery on the dual basis of a division of the corps into two branches, "sedentary" and mobile, and of the further division of these two branches into a number of small regiments, is at least premature. No such decision has been arrived at. So far, indeed, from this being so our information is that Lord Lansdowne has indefinitely postponed the further consideration of this question, and with his hands fully occupied with other work we are of opinion that he has exercised a wise discretion. Besides, pressure of other urgent business the Secretary of State has, doubtless, been influenced by the adverse opinion to change of the large body of senior artillery officers who have grown grey in the service of their country, and whose views as artillerymen necessarily carry weight. At the head of these senior officers stands Lord Roberts, the most distinguished of living British artillerymen. No Secretary of State for War and no Commander-in-chief would be justified in passing by the opinion of Lord Roberts on a question in regard to which he is specially qualified to act as judge. It is creditable to the good sense of Lord Lansdowne that he should have taken this view, and in accepting the distinguished field-marshal's advice has determined to reject for the present the drastic proposals which had been pressed on his notice by some active-minded enthusiasts for change.

There is no doubt that the time is inopportune for a disturbance of the "Royal Regiment." At no period in its memorable history has the Royal Regiment of Artillery been more efficient in all its branches than it is just now. The reports of officers who attended the French and German manoeuvres last year all concur in the view that in respect of fire tactics, fire discipline, and mobility our field artillery batteries have nothing to learn from, but much to teach, their continental rivals. Equally confident are the reports of those who have had opportunities of comparing the organization, work, and armaments of our coast artillery with those of foreign powers. Whether we judge from these reports, or from the accounts which reach us of the conduct of our artillery in the recent fighting on the northwestern frontier of India, or from the published records of the work done at home and abroad in the practice camps, both of field and garrison artillery, the conclusion is forced upon our minds that what is wanted is not change of organization with all its upsetting influences, but steady continuous progress on the lines which are now being followed with so much credit to all concerned. If there was any failure on active service, or any breakdown of system to record, the call for reform would be intelligible, but in existing circumstances the agitation would seem to have no solid ground upon which to stand.

An important factor in the discussion of this question is the altered condition of coast-defense warfare. Given even the destruction or "decaying away" of the British fleets—the supposition requires us to draw

considerably on our imagination—what remains for coast defense? There is a general consensus of opinion that warships will not attack land forts, having no purpose to gain by so doing, that distant bombardment is a bugbear, and that the only possible form of attack is likely to come from torpedo craft and an occasional stray cruiser attempting a raid. Such attacks can best be met by multiplying small quick-firing guns which are worked by the simplest methods, without the aid of any of those scientific appliances which are so terrifying to young horse artillery officers. The huge slow-firing guns now mounted in our maritime fortresses will gradually become obsolete without ever having been called upon to fire a single round in war. *That wonderfully clever invention, the position-finder, which was so hastily adopted and elaborated at enormous expense, is already discredited for purposes of practical warfare.* With all its complicated and costly appurtenances, it will doubtless follow the fate of the 80-ton guns, which are now being removed from Dover Pier, and will in future be valuable only as a testimony to the inventive genius of the eminent gentleman who contrived it. The undoubted tendency of the day is in the direction of a simplification of armament, and every year fresh modifications will be introduced with this object. The effect will be to minimize the supposed difficulties of artillery officers in mastering all branches of artillery science. Bearing this in mind, and the growing disposition to trust less and less to fixed defenses and more and more to mobile means of defense, this is clearly not the time for a War Minister who is responsible for the defensive policy of the whole empire to consent to an arrangement which would demobilize half our small force of artillery, and render it useless for any work outside the narrow sphere to which it was proposed to confine its duties.

It has been pointed out that the duties required from the Corps of Royal Engineers are as multifarious as are those required from the Royal Artillery. An engineer officer is employed one day in constructing barracks; another day he is found engaged in submarine mining work; later on the same officer is frequently transferred to the balloon, or telegraph, or pontoon troops of the corps at Aldershot; or he is required to embark with a field company for service abroad. In spite of these ever-varying calls upon his services, there never has been any desire expressed to destroy the unity of the corps or cripple its useful power by localizing its personnel and limiting their training to one special branch of engineer work.

In considering artillery questions or any other matters of military organization regard must be given to the Imperial necessities of the case. Our country wants an Imperial artillery just as it wants an Imperial navy, meaning by that an artillery which is fit for any and every work which the exigencies of war service may require from it. The parochial views which would limit the British artilleryman's sphere of duties to this or that technical branch of his profession militate against

this principle which is so vital to efficiency. On the Continent, where the conditions under which belligerents would act in time of war are clearly defined, it is possible to draw a line of demarcation between the duties of a fortress and field artilleryman. With us, where the conditions cannot be foretold, where a sudden necessity may arise for a large increase in our field artillery cadres, or where a death-struggle with one or more of the great maritime Powers may require the immediate strengthening of the garrisons of our coast defenses, the proposed limitations in the training and education of artillery officers could only lead to disastrous results. What is required is to move on yet broader lines, and still further develop the existing system by rigidly insisting on all artillery officers being thoroughly trained in all-round duties with a view to their services being utilized where for the time being they may be most required. This is the system upon which naval, artillery, and engineer officers have hitherto been trained with excellent results. We believe it is the right system to maintain for the British artillery, for unless its organization continues to be based on wide and comprehensive principles it will assuredly fail to fulfil its future Imperial rôle, and will descend from the high position to which its officers have raised it by their past services and present efforts.—*Army and Navy Gazette*.

## GUN OF NEW TYPE SUCCESSFULLY TESTED.

A very interesting and highly satisfactory preliminary test of a new type of steel gun was conducted during the latter part of January, at the Sandy Hook Proving Ground. The gun, which is of the 5-inch rapid-fire class, is so simple in construction that no drawings are needed to describe it to our readers. It is made of a single forging of steel, which, having followed the course of manufacture usual for large gun forgings, was, at a proper stage of manufacture, cooled from the interior from such temperature as to produce properly disposed initial strains of such intensity as would place the wall of the gun in the best condition to resist interior pressure.

The manufacture of the gun is due to the suggestions of Capt. F. E. Hobbs, Ordnance Department, United States Army, who pointed out several years ago to the Chief of Ordnance the advantages that could be obtained in the manufacture of guns by applying to forgings a modification of the Rodman principle of casting guns; that the process as applied to forgings could be made to produce exactly the initial strains desired; that these strains could be easily increased or diminished at little cost and that guns so made, while quite as strong, would be much cheaper to make than those built up.

An experimental forging made under Capt. Hobbs' direction at the Bethlehem Iron Works showed such excellent results, on being cut up and carefully examined, that the Chief of Ordnance ordered this 5-inch gun to be manufactured.

The thickness of metal which the gun should have and the proper

initial strains to be applied to give great strength were computed by Capt. R. Birnie, Ordnance Department, from his formulæ on the strength of guns. Capt. Birnie was an early convert to the methods of manufacture proposed, and has materially assisted Capt. Hobbs in perfecting the details of plans.

The gun is fitted with Gordon's breech mechanism, uses fixed ammunition, smokeless powder, a projectile weighing 55 pounds, can be fired from six to ten times per minute, depending upon the conditions of loading and aiming, and has a range of more than six miles. In the Sandy Hook tests a velocity of over 2700 feet per second at the muzzle was shown, and in the special high pressure test to which the gun was subjected, the pressures were registered of nearly 50,000 pounds per square inch.

The method of manufacture can be applied to forgings of any size that can be turned out by the steel-producing plants of the country; consequently, the calibre of gun which can be made of a single forging may be, to-day, set at 8-inch, but, by using this method, the number of parts in guns of larger calibre could be much reduced, while the guns themselves would be stronger.

It is probable, also, that the commercial engineering interests of the country will be found ere long following the lead of the Ordnance Department in this latest improvement in the treatment of steel forgings, as they did many years ago, in demanding for their structures oil-tempered and annealed steel forgings, after that department of the army had shown conclusively, by careful experimental investigation and by actual test, the safety and superiority of such metal.—*Scientific American*, February 12, 1898.

REPORT ON SOME GUNSHOT WOUNDS RECEIVED ON THE NORTHWEST FRONTIER.

In the *Indian Medical Gazette* last to hand there is an abstract report compiled by Surgeon-Captain J. M. Crawford, M. B., Indian Medical Service, on gunshot wounds received in action during the attack on the Malakand and in the operations immediately following it, which were transferred for treatment to the Base Hospital at Nowshera. Surgeon-Captain Crawford in forwarding particulars of the cases makes the following observations:—

Necessarily the cases were not received here at once, and as no information whatever was sent with the wounded men from the front, nearly all the history of each case had to be gathered from the patients themselves. Under these circumstances it can be understood that in most cases it was very difficult to determine accurately which was the entrance and which was the exit wound. The main points deserving notice are:—(a) There was not the great difference between entrance and exit wounds which would have been present had any but a non-explosive bullet been used by the enemy. (b) In many cases the bullets passed

close to important structures, such as bones, arteries and nerves, without injuring them, and even in cases where the bone was fairly struck, it was not extensively shattered or splintered. Only that portion of the bone which came into direct contact with the missile was injured, and other important structures in close proximity to the track of the bullet escaped unhurt. In cases where the bone was comminuted, there was not the extended splintering which would have followed as the result of contact with an explosive projectile. In many of the cases, the projectile had passed close to the bone, in certain instances grazing it, and yet no splintering was observed. The general good health of the wounded, the similarity between entrance and exit wounds, the absence of traumatic fever and the limitation of the injuries, all point to the fact that the wounds were caused by non-explosive projectiles of low velocity. The careful application of antiseptic dressings on the field has accounted to a large extent for the small amount of septic fever seen in the cases under treatment here, and also for the fact that no cases of tetanus have occurred.—*United Service Gazette*.

#### THE ARMY AND NAVY IN DEFENSE.

Vice-Admiral P. H. Colomb lectured before the Aldershot Military Society on "Coöperation between the Army and the Navy."

Admiral Colomb reminded the meeting that in 1891 he treated of the subject of coöperation between the army and navy in war before that society, from the point of view of the attack, and said that he proposed in his present lecture to consider it from the point of view of the defense. He claimed that no one who had been long watching the signs of the times could avoid noticing a growth in recognition of coöperation between the services. It was a vast and very complex question very little understood, but lying at the base of almost all our naval and military policy, and governing it if we were acting rightly and reasonably. Having dealt at some length with the confused notions which prevailed upon the subject, he examined what had been done and said of late years on the subject of coöperation. In 1789 a question was raised as to the openness to attack of the naval depots of Portsmouth and Plymouth, and a Royal Commission issued. It was clearly understood that their defense was a matter of coöperation, and it was assumed for the purposes of the inquiry that either port might be, in the temporary absence of the Channel fleet, open to an attack by 30,000 men if they could be assured of thirty clear days to operate in before our fleet returned. The Commission was divided in opinion, and so was the House of Commons, which, by the casting vote of the Speaker, decided that such an attack was impossible, and refused the money to increase the fortifications. Sir John Jervis, afterwards the great Lord St. Vincent, led the section that carried the day, and it pronounced that the coöperation of the navy could not fail in the defense, for that it was impossible the Channel fleet could be absent if such an attack were in the air. In 1859 the same

question arose, and another Royal Commission issued; but the reference assumed the entire absence of naval coöperation. As a fact, the question had already been decided and great expense incurred on the hypothesis that the navy would not coöperate. The idea that naval coöperation was little in mind was shown by the composition of the Commission—four military officers, two naval officers, and one civilian. Some of the conclusions at the Commission were that even if it were possible that a fleet sufficient to meet the emergency of a sudden naval combination against us could be kept available, it would lead to an outlay of public revenue far exceeding what would suffice for the object under other circumstances, and the Commission was led to the opinion that neither the fleet, army, nor volunteer forces, nor all combined, were sufficient security in themselves against foreign invasion. Their sense of the strategy of the question was shown by their agreement that a French fleet and army might be attacking Plymouth, while a superior British fleet was just outside the Channel mouth. The statement was that the British fleet could not attack the French fleet because it must remain in its outside position in order to protect commerce. This which now reads like another *reductio ad absurdum* was certainly not so considered at that time. One at least of the naval members was thoroughly imbued with the belief that the country would never provide a supreme navy. Admiral Colomb supposed that had there been equal naval and military strength on the Commission coöperation could not have been excluded. In 1888 Mr. Stanhope appointed a committee to inquire into the defenses of our mercantile ports in the United Kingdom. On this committee was a single naval officer, and though he endeavored to point out that the attack to be expected would be on our shipping, not on our ports, it was not to be expected that a single voice would change the color of a report which took no note whatever of naval coöperation. The lecturer proceeded to review the opinions of the Admiralty as disclosed by their acts from the early seventies downwards, ultimately gravitating towards the acceptance of the principle of coöperation. He then turned to the two conceptions of the action of sea power. In the one the naval forces of each belligerent are coming freely over the sea in all parts of the world. No fundamental principle of strategy governs their movements. The chief object of each is to attack and conquer territory, or destroy the enemy's property on land where getatable by squadrons. There is no particular design of bringing fleets and squadrons face to face to test superior power in clearing the seas.

It is assumed one power is attacking the territories of the other, while the other is making reprisals in the same manner. In this conception the only defense allotted to the navy is the defense of commerce, and this is assumed to be compatible with allowing ports of commerce to be blocked by the enemy as an end or preliminary to their attack. This conception excludes the idea of coöperation except locally. In the other conception the whole endeavor of the one power is to clear the seas of

the other, in the firm belief that until the whole of the enemy's naval forces are driven into port and closely observed there, there is, and can be, no complete protection either for commerce or territory. The winning power will make no attack on territory until he has safely locked up the enemy's fleet. At first sight it would appear that by closing in the enemy's naval forces the navy has completely protected commerce and territory, and there is nothing for the army to defend; then, indeed, all the military forces and all the naval forces not actually engaged in observing are free to assemble for coöperation in attack, but it would be foolish to suppose that we could carry it out completely. It could not be hoped that the observation would be in all cases perfect. Evading squadrons might escape to sea, and what was to prevent the enemy without our coöperating army garrisoning within suitable works our outlying territories from carrying them? Here, then, was the coöperation. It was plain that the naval force which had allowed the enemy to evade it had nothing more to observe; its secondary form of coöperation was to follow the evading squadron, and prevent its doing mischief. Then the element of time occurred which was fairly measurable, and the only coöperation which the navy would justly ask at the hands of the army was to hold out in any attacked point during that lapse of time. This lapse of time only included the period it may reasonably take for the watching fleet to reach the rendezvous, and the time it would take to steam from the rendezvous to the place attacked. To sum up the two conceptions: in the first here was a belief in the capacity of isolated territories to hold out indefinitely against assault and investment, and no over-mastering desire to keep touch with the enemy wherever he may be; in the second, the incapacity of isolated territories to hold out without naval help is recognized, but it is claimed that the surest way to afford that coöperation is to prevent attack by the close observation of the only forces of the enemy which could attack. The lecturer took the judgment of history upon these two opposing conceptions. The facts in the Crimean War were plain in confirmation of the truth of the first view; and our experience of 1779 to 1783 at times when our fleets were generally outnumbered in all parts of the world, and we did not know where to turn, was dead against the second view. Attacks on garrisons were not made either by France, Spain, or England, unless there was a local and temporary superiority of naval force. Garrisons alone had no defensive power; they almost always surrendered to attack when the coöperation of the navy was absent, and such a result might have been expected, as attacks were seldom made except with an overwhelming superiority on the side of the attacking force, and when naval coöperation in defense was impossible or unlikely. The success of Gibraltar in defense and the failure of Minorca were due to the presence in the first case, and the absence in the latter of naval coöperation. The lecturer examined coöperative defense under the three heads of defense of commerce, defense of outlying territories, and de-

fense of the United Kingdom. The army could materially coöperate in defending commerce by the maintenance of light batteries always ready for instant action, and covering such waters as merchant ships might safely run into when pursued. It was a mistake to suppose that heavy works and large garrisons were in themselves better defenses than small works and small garrisons. Malta would be as safe with a garrison of 1000 men inside a closed work covering the dockyard as it was now with 10,000 men. It was not a question of force, it was one of time. It would be as easy for France to send 30,000 men to conquer Malta as to send 3000, and if the works were properly arranged the time required to reduce them would be the same in each case, provided there was no question of time. France would only be deterred by fear of naval coöperation. An observing fleet at Gibraltar would force the French to cover an attack on Malta with their whole fleet, and would not allow time to complete an attack. Which was the secure system of defense? Large garrisons, closed up in works which they were not able to fully man, with no hopes of naval relief for a very long time; or small garrisons in small works, with reasonable certainty that any force proposing to strike at them would be crushed by a superior force from England in eight or ten days. In the uncertain days of sailing ships such a scheme might have been impossible, but now, when the length of voyages may be calculated by hours, was it so certain that a greater security may not be obtained by adopting such a plan? So far as the United Kingdom was concerned, the element of time to which he had just alluded did not concern naval coöperation, for there could be no such thing as temporary absence of the fleet. If the fleet was beaten so that invasion could take place, it was beaten for good, and any number of the enemy could be landed. Admiral Colomb expressed his fear lest the Regular and mobile army may not in the end be able to free itself from the incubus of ideas of sedentary defense. He had pointed how nearly thirty years ago the navy fell under that ban, and took away from the mobile navy money to build up an immobile one. They had been able to entirely free themselves from that error, and now bent all their energies to increase and maintain their mobility. They had no vested interests in maintaining any other system, and had the tremendous engine of the signatures of two lords and a secretary to deal with them if they had. In the army, taking it as a whole, more than half its members had vested interests in sedentary defense, who, from their point of view, were justified in fighting for it. There was no such independent and soulless body as a Board of Admiralty to control their desires. If there was money going they were bound to get some of it, and by so much the mobile army suffered. There was nothing that he knew of to prevent the mobile army from being gradually undermined by the perfectly legitimate but mistaken action of the sedentary army, except a constant and ever-increasing examination of the principles of coöperation.—*United Service Gazette*

## A NEW PORTABLE SEARCH LIGHT.

One of the chief objects of the recent French military manœuvres held at Velizy, near Versailles, was to teach soldiers how to save the wounded in warfare by night. The troops engaged were divided into two divisions—one under the command of General Treuil de Beaulieu and the other under the orders of Colonel Bailloud. After some manœuvring the two divisions engaged in battle, and amid the deadly fire of blank cartridge the wounded men were seen to fall with alarming frequency all along the lines, each wounded man bearing on his chest a ticket indicating the character of his wound. The men appointed for the duty came forward with the ambulances and began to convey the wounded with expedition to the field hospital which had been erected close to the battle-ground as soon as the fight began. The hospital was quickly filled, and the ambulance authorities were obliged to make use of the inn at Velizy and erect tents on the square by the church. Some of the village carts were pressed into the service of transporting the wounded heroes, and everything was conducted as it would be in actual warfare.

When darkness came on word was supposed to have been given that many wounded men had been left behind on the field of battle, and the order went forth that search parties were to go out and bring in the missing men. The intention of the authorities was to make a thorough trial of a new search-light apparatus invented by one of the medical staff of the army, a Dr. Mareschal.

The light (as pointed out in *The Daily Graphic*) can be fixed on a stand or it can be attached to a man, who can by its aid search the darkest recesses of a battle-field inaccessible to the rays of a stationary lamp. The apparatus is light, and appears to consist of a high-pressure oil-lamp, with a powerful reflector behind it, and a handle to hold it by, the apparatus being fixed as a knapsack is to a soldier's back. It is claimed that by means of this search light objects can be distinguished in the dark at a distance of 250 yards.

The French military authorities have not made public the details of the new invention, but it appears to be worked somewhat similarly to the lucigen light one sees in the London streets when the workmen are repairing the wood or asphalt pavement by night. The French portable lamp is silent, but the principle adopted appears to be almost the same. The ambulance authorities appeared to be perfectly satisfied with the result of the experiment.—*United Service Gazette*.

## MONSTER CANNON.

One is almost inclined to think from the particulars of a new coast defense gun which is being constructed for the United States War Office that the authorities there are anxious to play upon the besetting weakness of the people, and make them believe that since they will shortly possess the biggest gun ever made that will be sufficient to compensate for the deplorable de-

*iciencies of coast defense in America.* This gun is almost phenomenal ; it will weigh 126 tons, the length being 49 feet, and the calibre 16 inches. This monster weapon will fire projectiles, each weighing a few pounds over a ton ; or, to be exact, 2350lb ; while the powder used for each will be 1000 lb. But there is satisfaction in trying to realize a muzzle energy of 60,000 foot-tons, while the range will be 16 miles. It is quite a detail that this is further than one can see an object on the horizon, while a torpedo boat moving along at 25 to 30 knots will travel almost faster than the gun can be trained, and irrespective of the time between the shots, for a ton projectile cannot be manipulated easily.

It is curious, indeed, that the United States should go in for such weapons at the very time when European nations are discarding them. Our largest gun was the 110½-ton weapon put into the *Sanspareil*, *Benbow*, and the ill-fated *Victoria*, to fire a shot weighing three-quarters of a ton, but it was discarded as an unnecessarily powerful weapon, although the fact that it cost about £234 to fire one projectile from it may have had something to do with the matter. Our 45-ton is about as serviceable, and it costs only £25 to fire it. The American gun will fire away £400 or so of dollars every time it is used, but this is a small sum to pay for the honor. Germany, it may be added, more closely approximates to the American size with its 120-ton gun, which is 46 ft. long, and fires a 2204lb projectile with 903lb of powder. Italy has several 104-ton guns of 17 in. calibre and 40¾ ft. in length, firing a 2000lb shot with 900lb of powder ; while France's largest gun is only 74.2 tons in weight, 16.54 in. in calibre, and 32 ft. 6 in. long. It fires a projectile 1719lb in weight, using 595lb of powder. Under service conditions, our authorities, like those of other European Powers, now place more reliance on such weapons as the new 45-ton guns, with which our recent battle-ships are equipped.—*United Service Gazette*.

#### THE VICKERS NEW 6-IN. GUN.

The following particulars as to the distinctive features of the Vickers new 6-in. gun with which such very satisfactory results have been realized recently, are given in an exhaustive article describing Messrs. Vickers's works at Sheffield, which has just appeared in *Engineering*. In the first place, the screw of the breech mechanism is of novel design. Instead of being the usual interrupted screw pattern with screwed and planed surface alternating, the circumference of the block is divided into eight equal parts, with only two parts of the circumference of plane surface. After one plane surface, the next is screwed, the third is also screwed, but of slightly increased diameter, and the fourth is of still greater diameter ; and these four are repeated in the same order until the circumference is completed. Thus only one-eighth turn is necessary to lock the breech, while at the same time three-fourths instead of one-half of the screw block is threaded, so that the resistance to internal pressure is increased. By this and other details great powers are ob-

tained for working the usual system of obturation by the single movement of a horizontal lever without the semblance of any complication, and its action is such as not to necessitate a large space in working. In combination with this system of breech screw and mechanism, a new type of apparatus for working the firing primer is arranged, all its functions being worked automatically. The firing primer is placed in the vent with the breech open, and when the breech is closed the slide automatically covers the tube, rendering it safe until the mechanism is securely locked. Then, when the breech is opened, the primer is automatically ejected, and thus no time is lost in loading owing to the priming of the gun. The gun itself is of 45 calibres length of bore, and weighs 7 tons 8 cwt. Steel wire and long tubes form important elements in the construction of this gun, which is specially strengthened in the chase to withstand the somewhat higher chase pressures necessitated by the greater energies required. It was considered desirable by the Admiralty that such a type of high-power gun should not make use of the ordinary type of metallic cartridge case for holding the charge. Trials were therefore considered necessary with a view of obtaining the highest-powered type of heavy quick-firing gun embodying a special type of obturation not necessitating metallic cartridges.

The mounting of this gun is in appearance very compact, and could be easily and quickly applied with little constructional alteration for the purpose of rapidly armoring our large mercantile fleet should occasion demand. The gun is made to slide in a cradle bored eccentrically in such a manner as to give the necessary strength for the transmission of the recoil, whilst the thinner part forms a cover to prevent dirt from getting between the rubbing surface, as well as to offer greater protection to the gun. The cradle is mounted on trunnions resting in trunnion bearings which are so arranged that the gun can be easily and quickly housed inboard. The trunnion bearings are in the form of caps, and rest in the top carriage. The top carriage is of very strong design, and the lower part is in the form of a long sleeve, which is dropped over the pivot and balanced on a small ball bearing at the centre and top of the pivot, and placed in such a manner that the balls can be easily got at, and adjustment made if desirable. The pivot on which the mounting revolves is hollow, and very strong for its weight. The lower part is flanged in such a manner as to offer a large deck service to take the downward strains at the time of firing. The design gives great elasticity, and should the mounting be struck the thick sleeve of the top-carriage gives additional protection to the pivot as well as to the training-rack and worm. The elevating and training arrangements are simple, and embody novelties in design. From the ease in working they appear satisfactory. The sighting arrangements of this mounting are new and original. A range indicator and sighting telescope form an important alteration from the usual sighting arrangements, which in a gun of such high power are of utility.

The trials of this gun have been very extensive and satisfactory. With an old service type of 8-inch mounting, a rate of fire of one round in 10 seconds was obtained, and as the striking energy at each round of this gun was 5374 foot-tons, as against 3231 foot-tons in the existing service weapon, the rate of fire was considered satisfactory. With a complete equipment of the gun and mounting in the *Pincher*, 110 rounds were fired, representing more than half a million foot-tons of energy, the rounds being fired in series of varying numbers. The best series gave one round in  $9\frac{1}{5}$  seconds, while 20 rounds were fired unaimed in 214 seconds. Another series of 36 unaimed rounds was fired with great rapidity without any difficulty, the breech mechanism working easily and quickly throughout the whole series. Twenty aimed rounds were fired at two targets in 259 seconds, and the shooting during this series was excellent, the breech mechanism and equipment generally working without a hitch. In another series of trials made to test the continued accuracy of the weapon after having fired 200 rounds, the charge consisted of a 100lb shell with cordite and service primers, and in the first 10 rounds in which the gun was tested for accuracy, two of the shells actually passed through the same hole in the target. In the rapidity tests 36 rounds were fired in four minutes 47 seconds, in which time was included that necessary for taking the temperature of the vent head. The greatest speed attained was one round in  $6\frac{1}{2}$  seconds, whilst eight rounds were fired in 7 seconds each. The gun has given a muzzle velocity of 2784 feet, with a pressure of 15.9 tons.—*United Service Gazette*.

## Comment and Criticism.

### **"Based on Present Conditions and Past Experiences, How Should Our Volunteer Armies be Raised, Organized, Trained and Mobilized for Future Wars."**

**General W. B. Bend, Minn. N G.**

I HAVE read with much interest Lieutenant Foote's article on the manner in which our volunteer armies should be raised, organized, trained and mobilized for future wars, and granting the correctness of his assertion, that the National Guard does not constitute a force which can be relied upon in an emergency, his plan is an admirable one, but I think that any one conversant with the National Guard of to-day, knows that it is composed of very different material from the National Guard of 1861, and that its officers are much better posted in their duties than were the officers at the breaking out of the Rebellion.

It seems to me that the National Guard has all the necessary elements to make such a force as we should have, and that no plan can be as good as one based on this theory. There is no doubt that we should have a force under the exclusive control of the President, but it cannot be had without the expenditure of a round amount of money, and I notice that Lieutenant Foote proposes to spend a million annually. If Congress is willing to appropriate the necessary funds, I suggest that a law be enacted organizing the United States National Guard, and allowing all the State organizations to be mustered in. Provide, that except when ordered into active service by the President, the enlisted men shall only be required to attend drill one evening a week and go to camp for ten days, and that the officers shall, in addition, attend officers' school once or twice a week. Also, that officers shall be examined annually, and incompetents mustered out. The Government to uniform, arm and equip the troops, furnish armories, and pay at regular rates for the ten days in camp. Make it optional with the State troops to be mustered into the service of the United States, but repeal the act now appropriating \$400,000 annually for ordnance and quartermasters stores, and thereby place on any State, the National Guard of which declines to enter the service of the general government, the entire expense of its support. Require the commanding officer in each State to respond to any call made on him by the Governor, provided it does not conflict with the law, or with the orders of the President.

I think that with such a law as I have briefly outlined, we would have a large increase in the National Guard, and would, in a few years, have an auxiliary force which would be equal to any emergency that might arise.

I must take exception to Lieutenant Foote's statement on page 42, that the draft riots of 1863 were stopped by some "Regular troops and volunteers sent back from the theatre of war." The riots were stopped by the Seventh Regiment National Guard, State of New York, to which I had the honor of belong-

ing. The regiment arrived in New York from Frederick, Maryland, on Thursday, July 16th, and reported to General Wool at the St. Nicholas Hotel. It had a brush with the rioters in the Second Avenue that afternoon and evening, and on Friday morning it surrounded the rocks east of the Third Avenue and north of 42d Street, which were called "Mackerellville," while the police went through the houses and seized a large quantity of arms. By Saturday the 18th, order was restored and there was no further trouble, although a part of the regiment was kept on guard at the armory for some time.

**Colonel T. F. Edmands, U. S. Vols., Comdg. First Corps of Cadets, M. V. M.**

Lieutenant Foote, in his paper published as a prize essay in the January number of the *SERVICE JOURNAL*, has been quite successful in collating his historical facts, and he makes some strong points; but he is not always quite correct in his conclusions; nor does he seem to have succeeded in making a practicable suggestion of the best means by which a volunteer army may be provided for.

What he says about the term "National Guard," as applied to the militia is sound. The designation certainly is a misnomer, and he is right in saying that the army alone is the real National Guard (pages 17 and 18).

His estimate of the numbers required (pages 18 and 19) probably understates the matter. His motives for restraint will be recognized by officers who do not wish to be considered alarmists.

It is a coincidence that the error he falls into (pages 20 and 21) when he assumes that militia cannot be made effective as heavy artillery, should be so happily controverted by Lieutenant Weaver's comment (pages 203 to 217 of the very same magazine), wherein is set forth the result of an experiment in Massachusetts which can easily be repeated in every seaboard State. Lieutenant Foote is right in saying that heavy artillery should be under the supervision of Regular officers; but, unless he determined to treat militia officers *de haut en bas*, he may change his opinion, if he should have, like Lieutenant Weaver, an opportunity to realize that there are, in the militia, among the busy men of affairs who are improving it every day, not a few bright minds and earnest spirits who find the study and a fair comprehension of military matters no harder than the successful conduct of mercantile business.

Neither will it do to assume that the right-minded militiaman loves "Governor's Day." As a matter of fact, he hates it. The girls, politicians and the newspapers may like it, each from their own point of view; but the day has long since passed when fuss and feathers are anything but a bother and an aggravating interruption and utter waste of time to well-ordered militia trying to do good work.

As to militia cavalry and light artillery, perhaps Lieutenant Foote is nearer right than is comfortable to think of, except in rare instances; yet there are some fair examples of mounted service to be found, and there is a strong emulation arising among the States to improve their cavalry and light artillery.

With Lieutenant Foote's remarks on the infantry of the militia it is hard to be patient, because he is unjust. He seems to overlook, or count as naught, the very men who would unquestionably be the "accomplished drill-masters and disciplinarians" about whose existence he seems to be at once skeptical and solicitous. For the infantry in our volunteers at least, we should, in

spite of his doubts, have them "ready at hand at the outbreak of war." His opportunities for observation in this respect have evidently been narrow.

Concerning the time required for preparation at home and for a foreign nation to attack the United States, Lieutenant Foote is sound, and introduces some interesting quotations.

But when he reaches the main object of his essay, his system for raising volunteers, he becomes impracticable. He ignores dollars and cents and mercantile conditions in about the same fashion that civilian war critics usually ignore perspiration and the limitations of human endurance. In our day and generation he will never see his scheme adopted; but there may still be a way in which much may be done toward doing away with the hap-hazard method which, now our only resource, gives thinking men anxiety and forebodes evil.

It is easy enough for any one to sit up and criticise a suggestion as impracticable. It is quite another thing to point out something feasible, and to prove it. Therefore it is unfair to Lieutenant Foote to do the one thing without doing the other. He has evidently bestowed much thought on his essay, and has taken pains to present his ideas with care and lucidity. The following plan, hastily sketched for want of space, is offered for what it is worth, based upon experience before, during, and since the late War of the Rebellion.

The militia is the place in which to train the bulk of the men who are to create, discipline and control the volunteers. The first thing to be done is to make a militia law uniform in the several States to supersede the quaint, obsolete law of 1792. The States themselves can never do this. It must be done for them by a convention of Regular army officers expressly charged for a reasonable time, say three years, with the duty of observing the needs and the capabilities of the militia all over the country, before any attempt is made to frame such a law.

As a prelude, the army and the militia must be affiliated to make them work together. Each must help the other. The militia needs the army as an example, as a fogleman, if the expression may be permitted. The army needs the militia because the militia has votes and can control votes. This is perhaps rather a blunt way of stating a matter of practical politics. It is a pity that it is the case; but it is the truth, all the same. The people, as a rule, know very little about the army, because they see so little of it. A regiment of infantry at least, ought to be stationed in every State, supplemented by battalions or regiments of heavy artillery in the seaboard States according to the length of their coast-lines or the importance and number of their cities and harbors, with the light artillery and cavalry disposed according to the supplies of horses and other exigencies of service. That would mean a Regular army of one hundred thousand men. This agrees with Lieutenant Foote's ideas as to the necessary army increase, if not with his disposition of it.

The average legislator at Washington will tell us that the people will never stand any such thing. That is purely the politician's view, and he is wrong. There may be a noisy political minority who make him believe that sort of thing, but the bulk of the people are quiescent, more from indifference than anything else; they would support the army as willingly as they support the militia if it were among them in the same way.

There is no doubt that the militia would welcome the presence of the army in their midst. If a few prominent States, where the militia is well organized and hence well supported by the people, were to demand of the general govern-

ment that it should send them Regular regiments to set the pace for their militia, it would not be long before other States would make demands for the same thing; and that would mean new regiments, for there are not now enough to go around. The regiments so assigned would become in a measure identified with the States, and the people in the States would see to it that their Regular regiments had what was due them. This is simple human nature, and if the Regular troops were properly controlled, especially in affiliation with the militia, both services would benefit.

Such a scheme is not utopian. It is practicable, like the results that it might bring. Regular officers living among the people, especially living among the militia, would soon find out what could or could not be done with both, so that when called together to submit a military plan, the officers so selected could base their ideas on facts instead of theories.

It will be noted that it is not special details of Regular officers that is here contemplated, but whole regiments, fully officered, at work. The question whether detailing Regular officers to drill collegians or school boys does any good, need only come in here long enough for the present writer to say that while some good may have come from college details, he believes that military drill in the public schools has thus far done harm to the militia. There is a strong feeling to this effect in Massachusetts at least, where for more than thirty years the worthlessness of so-called military drill, as heretofore taught in the common public schools, has created an opposition to it on physical as well as military grounds. If Lieutenant Weaver of the Army, lately detailed to take charge of the drill in the Boston schools, can get some discipline into the boys, and make them understand that ceremonies and parades are not the whole of a soldier's duty, he will earn the thanks of the community, and its hearty support.

To return to the main point; each State can do more in a year for a practicable volunteer system with the object lesson of a good Regular regiment present with its colors than can a century of theorizing. The people can be made to believe in the army and the militia. They would probably take very little stock in Lieutenant Foote's intermediate skeletons. But the principal defect in his suggestion is its great expense in details overlooked by him, such as armories and drill-grounds (very costly affairs) together with general equipment. Moreover, he shows that he is hardly in touch with the business necessities and habits of the men he wishes to train for the volunteers, when he proposes that they should give an amount of time which none but a leisure class (comparatively small in this country—too small for his purpose at all events) could possibly afford to give in these hard days of modern mercantile competition. The militia gives a week in a year for camp and an evening a week for drill. That is about all the strain that the average non-professional soldier in this country can or will stand.

As a last word, let us repeat that the militia must be kept alive, in war as in peace, as the mother of regiments, training men for them in advance, recruiting for them when war comes, acting always as do the home battalions of some foreign services. And let us hope that when this country does have a military system worthy of the name, it will forbid the raising of any new regiment of volunteers while one on active war service in the field has less than a thousand men with the colors, as the minimum of a regiment of three battalions (twelve companies). As to the colonels and other officers of volunteers, we can take the best men, Regulars or others. What we want is fighters.

BOSTON, February 3, 1898.

Colonel F. L. Hitchcock, U. S. Vols.

As a citizen deeply interested in the subject, I desire to express my gratitude to Lieutenant Foote, 4th Artillery, for his able article entitled "Our Volunteer Armies," in the JOURNAL OF THE MILITARY SERVICE INSTITUTION for January. The problem he attempts to solve is one of tremendous importance to our country, and is fraught with grave difficulties. Any discussion which will keep the question before the public and help to elucidate it should be welcomed. Our people should be made to realize that so far as our land forces are concerned we are in almost as helpless a condition as is China to-day. We have so long rested in the security of our ocean isolation that we have failed to perceive that modern transportation has annihilated this isolation and brought Europe and Asia right to our doors. We can no longer rest secure upon the doctrine of non-intervention in foreign affairs. Should a European war break out, we are liable to be drawn into it whether we will or no. And in the maintenance of our traditional policy toward other nations, particularly the Monroe doctrine, war is no longer to be regarded as a remote possibility. Hence the urgent immediate necessity for a present force available for action at all times, sufficient for defensive purposes at least.

I fear Lieutenant Foote's plan will not meet the needs of the country, and I beg to submit my reasons therefor, together with some observations upon a system which I think will more nearly answer our requirements. The plan of Lieutenant Foote, in brief, provides for a system of skeleton regiments, existing in their officers only, placed throughout the States in geographical districts according to population; these officers to be instructed and ready for the filling in of the rank and file, either by recruiting or conscription, whenever the emergency arises.

To my mind the radical defect of this system is that it is only a partial preparation. Good, as far as it goes, it is both too late and too slow for defensive purposes. It does not contemplate the habilitation of its regiments until after the need of troops has arisen; and then thirty days is required for that purpose. At the end of this period,—supposing the machinery of recruiting or conscription has been successful in filling up the regiments, which may well be doubted,—what have we? An organized force fairly well officered, it is true,—but of absolutely raw material. Under less than three months' hard drilling it would be mere food for powder. Under this system we would have a period of three to four months after war had been declared, during which we would be absolutely at the mercy of the enemy, so far as this system would help us. I am aware that the scheme of Lieutenant Foote contemplates, in case of emergency, the doubling of the Regular army to 50,000, and utilizing the National Guard of the several States, which he placed at 106,000, for a three months' service. This is his picket force, so to speak. But this 25,000 addition to the Regular army is to be raised *after* the *emergency* has arisen. It is therefore a paper force only, and the 106,000 National Guard of the several States are admitted to be State troops only, and therefore unavailable. They would be under no legal obligations to respond to the call of the Government of the United States. They are State troops, enlisted solely for State purposes. Sec. 67, Act of the General Assembly of Pennsylvania of the 13th of April, 1887 (P. L. 37), under which its National Guard is organized, provides when these troops can be called out for active service as follows: "When an invasion of, or insurrection in, the State is made or threatened, or a tumult, riot or mob shall

exist, the Commander-in-chief shall call upon the National Guard, and at his discretion,—upon the enrolled militia,—to repel or suppress the same. \* \* \*

This is the only authority for putting these troops into active service. Manifestly they cannot be sent out of the State. This is probably true of all the State Guards. Our experience in the Canadian campaign of 1812, when the militia of the border States squarely refused to go across the border to the support of our little volunteer army, and left it to a losing campaign, should be quite sufficient.

It is therefore clear that this "picket force" practically drops out,—except the 25,000 Regulars. But suppose this whole force could be utilized. It would be barely half large enough. Suppose the enemy to be England, with her giant colony, Canada, on the north. The latter, with a well-organized militia all under one head, could occupy every city and strategic position on our border within twenty-four hours. It is too late to prepare for war after war has begun, France and China are both recent object lessons on this axiom.

Another weak spot in Lieutenant Foote's system is the superficiality of its educational work and its want of cohesiveness or staying power. Its instruction of officers would necessarily be largely theoretical. In the making of an officer, nothing can take the place of actual contact with men, in company and battalion. Again, unless an immediate war should break out and give it a lease of life, I feel sure it would speedily disintegrate. Its regiments, existing only as skeletons, would lack vitality. There would be nothing to keep them up. There would be no *esprit du corps*. The duty required would very soon become monotonous and burdensome, and having only a remote promise of utility, would quickly cease to hold its members, and the system would fall.

Now to the plan which seems to me better adapted to our republican institutions,—and therefore more practical,—and which I believe really solves the problem.

The Constitution of the United States confers upon Congress (pl. 16, Sec. 8, Art. 1) power "to provide for organizing, arming and disciplining the militia, and for governing such part of these as may be employed in the service of the United States, reserving to the States respectively the appointment of the officers, and the authority of training the militia, according to the discipline prescribed by Congress."

Pl. 15, of the same section, confers upon Congress power "to provide for calling forth the militia to execute the laws of the Union, suppress insurrections and repel invasions." A proper exercise of the powers of the Government under these provisions of the Constitution will, in my judgment, solve this question. The Congress should pass a law providing for "organizing, arming and disciplining a portion of the militia," to be known as the National Guard of the United States. This bill should provide for the number to be called into this service; their allotment to the several States; the system of drill and discipline to be prescribed; the term of active service required in case of war, insurrection or invasion,—say not to exceed six months; for instruction, and inspections, etc., and providing that every State, which shall by law duly enacted, accept the provisions of this Act of Congress, and organize and maintain its proper quota of the National Guard up to the required standard of efficiency, shall be entitled to be reimbursed from the Treasury of the United States for the entire cost of organizing, drilling and maintaining the same, year by year. Such State should also be reimbursed the cost of armories and arsenals

and all other outlays made necessary in maintaining the Guard. The efficiency of the Guard should be promoted by the erection of such additional armories as might be needed. The National Guard would be, as now, in the control of the States, under their reserved power in the Constitution, *but subject* to the call of the Government in case of emergency, for a period of not more than six months' service. For this service the Government could well afford to pay for maintaining the Guard. The outlay, basing it upon a force of, say, 300,000 men, including uniforms, arms, etc., would run from \$12,000,000 to \$15,000,000 per year,—say it would reach \$20,000,000 annually. This would be a very moderate outlay indeed for the value the Government would receive from it. It would be our "ounce of prevention."

Suppose some of the States should neglect or refuse to accept the provisions of this Act of Congress,—a contingency, happily, no longer probable,—then, exercising its right under the Constitution, the Government would step into that State, call forth, organize and train such a number of the militia as would supply the required quota, organizing it purely as a part of the National Guard.

In the exercise of these powers, the Government would utilize the National Guard of the several States as existing, it having been re-organized to conform to the Act of Congress. Will it be asked if this would be an effective force?

The reply is found by a reference to the present condition of the National Guard of most of the States.

Gen. W. T. Sherman said, on reviewing the National Guard of Pennsylvania in 1884, in Washington, that they were thoroughly well fitted to take the field. General Sheridan repeated the compliment on a similar occasion some years later, expressing great admiration for their fine organization and "business like air," as he expressed it.

These were not idle encomiums, for the N. G. P. has never been noted for show qualities. Its only claim to recognition has been its "business" qualities. My observations convince me that the Guard of other States is equally good. If not, it can very readily be made so, and the whole Guard can be made as much better as the Government shall afford better facilities for its training and shall require a higher standard of efficiency.

Here, then, is a system that would be popular with the people,—would furnish a well organized, trained and disciplined body of troops, ready at all times to take the field, and good for six months active service. This six months would be the salvation of the nation. During that time an army of any size could be organized in the ordinary way. In the meantime, what might not be accomplished with the force at hand? If, as suggested before, the conflict was with England, *we would hold our own at least* along the northern border. We ought to take Canada within that time.

In the Franco-German War of 1870, from Saarbruck to Paris required less than six months. Another point in favor of this system, would be its educating influence upon the mass of our young men, and herein it would far excel the system of Lieutenant Foote. Every five years would see an almost new body of men in the Guard, whilst the old men having served their turn would drop out. These ex-guardsmen would carry with them their military training and ardor, and soon we would have scattered through the country a large body of splendid men, from which to officer and train an army in time of need.

To me, this system possesses so many points of excellence that further elaboration seems unnecessary. I trust it will commend itself to thoughtful men,

to the end that it may be speedily put into use and our country thus put in position to take care of itself when the necessity arrives.

Colonel Winthrop Alexander, D. C., N. G.

One of the most important things needed for the future security of this country is just such a scheme as that proposed by Lieut. Foote,—a plan by which the nation, while having but a small permanent force, will maintain by a systematic method a framework upon which to build future volunteer armies.

We of the National Guard,—and I use the term in its true and strongest sense,—although actually at present but State troops, have no other idea in mind but that we would be called out and ordered into service intact at the approach of national danger.

It would probly be difficult to find a National Guard officer who would wish it otherwise, or expect his regiment to stay at home simply because it was part of a State force and not in the service of the general government.

As to the statement that "we could not depend on it (the National Guard) to carry on a war," I think that is an injustice to the force, provided, of course, its quality is referred to and not its size. If it were large enough to answer the purpose, it could be relied upon to volunteer *en masse* and do its duty as long as required.

No doubt, if the war were extremely unpopular, difficulties would arise in securing its services, but this would also apply to the raising of volunteers and conscription would have to be resorted to.

The main point is that the National Guard is composed of exactly the same class of men who would be drawn upon to fill the proposed volunteer regiments, but with the great advantages of organization, a fair supply of arms and equipments and a certain amount of instruction and discipline. Why these National Guard regiments, volunteering as they exist, which they certainly would do, could not be depended on, is something I cannot understand and do not believe.

Lieut. Foote says: "Our past experiences, however, show that we can not do so."

The National Guard, which has developed into its present condition almost entirely since the Civil War, and largely by its own efforts, has never had a chance to demonstrate its unfitness as a national defensive body, so the experience has not been passed through which teaches its unreliability.

On the contrary, the many hundreds of cases where it has been engaged in maintaining the stability of the civil government since the Civil War prove conclusively that it can be depended on to do its duty as soldiers. The occasions calling for any criticism of its work have been such a minute proportion of the whole, a fraction of one per cent., that they can give no just ground for an argument against the force as a body.

How could it be otherwise, when in its ranks and holding its commissions are found a class of men fully up to average citizenship, with a love for military duty and a desire to learn which is as yet unsatisfied. It is a truly representative body of the people and its actions are an index of the sentiment of the public at large.

If the National Guard volunteers for a war, there will be no trouble in raising as many additional volunteer regiments as are required. If the National Guard holds back, the Government will have to change its policy or resort to conscription.

It is a little discouraging to us of the "play-soldier" force to have our professional brothers doubt our motives and question our value, but there is some satisfaction in *knowing*, as we do, that we are not afraid to march over a State line in case of need and would certainly fight as well as green volunteer regiments.

Aside from this little digression, however, it is evident that when more men are needed than can be supplied by the existing organized forces, a method of raising volunteers which will be entirely under the control of the Federal Government and will be built up on a framework of fairly instructed officers, will be of inestimable value, and Lieut. Foote's plan of utilizing the Congressional districts as military territories seems to be practical, simple and effective.

Some of the details of the scheme may, however, have some disadvantages when put to the test. One of these would occur if officers held commissions in both the State troops and volunteers. If the National Guard becomes a part of the volunteer force of its own volition, as I believe it would, such an arrangement should not be allowed.

I think that the National Guard should be kept entirely separate from the proposed skeleton volunteer system, and made a distinct part of the general plan, being a force to step in at once and furnish protection until the volunteers were sufficiently well trained.

Its work would not then be done, however, as it should remain in the field on exactly the same footing as the volunteer regiments. Being on this basis there would be no reason for National Guard officers or men transferring to the other volunteer regiments, and they would return home at the close of hostilities with the same organization as when they went out, taking up again at muster-out their State character.

Another point in the scheme which seems to need a correction is the duration of annual training for volunteer officers. While ten days is probably as much as could be spared away from business pursuits, it seems hardly enough in which to give the desired instruction. I think it should be supplemented by a continuous course of study similar to the work now done by "correspondence schools," the results of which are excellent. This is beginning to find a place in National Guard work and to my mind is a great step in advance for teaching men who have to devote every day to earning a livelihood.

One point in particular in Lieut. Foote's essay to which I must take exception is that relating to the improbability of deriving assistance from the State troops in manning the coast fortifications.

My own experience and observation lead me to form an opinion exactly opposite, to believe that very valuable assistance can be rendered if existing State organizations are drilled and instructed in that line of work by professional artillerymen.

I can only refer to the article by Lieut. Weaver, 2d U. S. Artillery, in the January number of the JOURNAL, as proof that such work not only can be done by militiamen, but is being done in Boston harbor and in a very creditable manner.

Far from that branch of the service being unpopular or unfitting the troops engaged from aiding the civil authorities at any time, the reverse is quite true, in that particular case at least, of which I have personal knowledge.

Why, also, is it not the business of State troops to man United States forts? The damage done in case the forts are forced will fall upon citizens and prop-

erty of the State. The forts are not alone for the protection of United States property in the vicinity.

As a matter of fact, this is exactly what happened in Boston harbor at the outbreak of the Civil War.

Volunteer militia organizations at once offered their services, were mustered in to the United States service and placed in Fort Warren, to the great relief of the general government.

It will, I think, give better results to train the existing sea-coast regiments of the National Guard, whose officers and men are accustomed to each other, than to give the same amount of instruction in heavy artillery to the corps of officers contemplated by Lieut. Foote's plan, many of whom would not be trained to the handling of men, and who would, when the occasion arose, have to break in a mass of green men to the work.

If the War Department would only give half the help and encouragement to develop this line of work in the National Guard that the Navy Department has toward building up the Naval Militia, which is also a purely State force, the results would be of the greatest value to the Government in time of need.

The scheme proposed by Lieut. Foote is, however, excellent. Its possible results would raise us from the rank of a nation with no military *system*, to one having a well-defined plan for emergencies, peculiarly well adapted to our institutions, conflicting in no way with the Constitution or existing laws, and easy to put into execution with a comparatively moderate outlay.

But pray do not let the \$1,000,000 required prevent the National Guard from getting its present scanty appropriation from the Government.

**Col. Charles Pfaff, First Regiment of Heavy Artillery, M. V. M**

In venturing, not to criticise, but to offer a few comments upon the exhaustive and instructive prize essay of Lieut. S. M. Foote, published in the *JOURNAL OF THE MILITARY SERVICE INSTITUTION* for January, 1898, my greatest fear is that those officers of the Regular Army who are not conversant with the work in sea-coast defense which is being done here in Massachusetts and who therefore are unacquainted with our aims and purposes may assume that the members of the First Regiment of Heavy Artillery, M. V. M., entertain the idea that they are or may become proficient artillerymen. Such is not the fact. Our only hope is that by close study and application, our efforts being directed and guided by a skilled and practiced soldier, we may gain a sufficient knowledge of the rudiments of the science to render our services of vast importance should untoward events cause them to be required. It is noteworthy that the expressions of doubt and misgiving relative to the practicability and feasibility of a militia organization becoming of any value in heavy artillery work emanate almost altogether from officers in the Regular service who have had no opportunities of personal observation of our work in camp and in armory, while, on the other hand, we receive our warmest support and encouragement from those who have been affiliated with us and have watched our every movement with keen and critical eye. I invite attention to the reports on our encampments at Fort Warren in 1896 and 1897 made to the War Department by Col. Kline and Col. Woodruff and to the article in the January number of the *JOURNAL OF THE MILITARY SERVICE INSTITUTION* over the signature of Lieut. E. M. Weaver, 2d U. S. Artillery, beginning on page 203.

After a careful perusal of these papers can any one doubt that a body of

troops which can do and which has accomplished such work as is credited to us could be other than of material assistance to the Regular forces. It is an acknowledged fact and one realized by none more forcibly than by the members of this regiment that our Regular artillery forces are totally inadequate to man the fortifications we now have. New regiments of Regular artillery must be organized and to my mind the proposition now attracting public attention, namely, the formation of two new regiments, is quite insufficient for our needs. Should the National Government become involved in a war with some foreign power is it not certain that our coast cities would be in a most perilous position? Would it not be necessary to at once fully man such fortifications as we now have and hasten as rapidly as possible the advancement of those now in process of construction? Each new battery completed means more artillerymen needed. Where are these men to come from? New regiments would have to be enrolled and, under such conditions, would not a regiment of militia, composed in great part of skilled mechanics, with even only a modicum of artillery training and instruction be invaluable as compared with a hastily formed regiment of men, drawn from any and all walks of life, men who would have to be taught the first principles of soldiery before they could be of the slightest use in artillery work? Lieut. Foote says "But the heavy artillery service is not of a nature to be popular with the militia." To this I must take exceptions. Admitting that "It is all work and no play. No crowds of admiring spectators, etc." the work is so popular with us that we have no difficulty in keeping full enrollments; our personnel also is superior to what it has ever been heretofore, and is constantly improving. The work is so interesting that the average term of enlistment is lengthening. While in previous years we have had visitors' days it was well known that during the encampment of 1897, visitors would not be allowed at Fort Warren, yet we had present for duty an average of 98.6 per cent. of our total enrollment, which was but one man short of the maximum allowed by law. On breaking camp there was more earnest and sincere enthusiasm throughout the regiment over the work than I had ever before seen displayed. In conclusion let me say that I am perfectly confident that a thorough and close inspection of our work, a complete understanding of our endeavors and aspirations will convince army officers beyond the peradventure of a doubt that the National Government can place great dependence upon State aid in time of peace or war toward providing a force to assist in manning our fortifications.

**Lieut.-Col. George M. Cole, 3d Regiment, N. G., Ct.**

There is much that is interesting and instructing in Lieutenant Foote's essay. "The subject is one that ought to receive the immediate attention of Congress as a matter of economy."

I cannot agree with him, however, in his plan for raising a volunteer army, neither do I like the tone he assumes when speaking of the National Guard; see page 18—8th, 9th and 10th lines, to which I take exception, ignoring the fact that he is speaking of the present and future, yet he cites the old Militia of before the War of the Rebellion as an object lesson of what they would be in the event of war. We all know that the militia of thirty or even fifteen years ago is not to be compared with the National Guard in the East to-day. Where will you find troops that have given better account of themselves than the National Guards of Pennsylvania and New York? Theirs was a test of honor. A brother

in the ranks with perhaps a brother in the mob, etc. How well they stood the test is a matter of recent, not "ancient," history.

The Regular army has no better friends than the National Guard to-day. "Cultivate it," for the fact remains that in the event of war, whether we go in as an organization or as individuals, we shall figure very largely in the first line.

We, of Connecticut, would have to go in as an organization. Our oath requires it; there are no ifs or ands about it. If there is a State in the Union that has an organized militia force that is not so obligated, it should not receive one cent from the National Government. The trouble is that Congress is negligent in not making a National Guard *in fact*, and a Regular army of such size and modern organization that it would be a credit and honor to the nation, ignoring the hard lesson it learned, or seemingly failed to learn in the War of the Rebellion, the result of which is the pension roll to-day. *Where is the economy?*

The system which Lieutenant Foote advocates for raising a volunteer army may be a good one in theory, but it is not so practical in my opinion as would be a properly organized U. S. National Guard.

*For this reason:* "You will find better officers in the Guard than out of it." and nine-tenths of them would not be able to devote ten days to camp duty in addition to the camp duty they do now; in fact, it is well known amongst ourselves that many devote their entire vacation to military duties to which they have already obligated themselves, and while many may wish "in their hearts" to extend that time, their employers would say that too much time is wasted in soldiering now. The more feasible and practical plan is for Congress to nationalize and enlarge the existing organized militias of the several States, appropriating sufficient money to make it efficient, exercising a certain amount of control over it as to the appointment of officers, duties to be performed, time devoted to drill, etc., and on declaration of war, the absolute control to be with the National Government.

Eliminating all the old militia ideas from the National Guard, you will have a school for the volunteer army not to be improved on.

There is one thing the essayist omitted to state, that even if the militia of 1861 did not volunteer as organizations, it sent some men to the front who were whole organizations in themselves, notably the present Commanding General of the U. S. Army, and our own Terry, of Connecticut, both of whom, with many others, learned the A B C of their profession in the old and much despised militia.

## Reviews and Exchanges.

LATE in the year 1897 appeared the first number of a collection of technical papers,\* prepared by engineer officers of the Belgian army.

The appearance of future numbers will be at such times as available material will justify.

All the engineer officers of the Belgian army on the active list, the majority of those on the retired list and some former engineer officers have combined to publish in this form their studies of subjects connected with the various specialties of their branch of the service, translations of foreign works, and memoirs and articles from officers of other branches.

The Inspector-General of the army is at the head of the publishing committee, which guarantees freedom of thought to authors, who in turn alone are responsible for their opinions.

Belgium's position among the continental powers is reflected in five of the eight papers printed, which treat of permanent intrenched camps, defensive lines of fortresses, the attack and defense of fortified places, and devices for bridging dry ditches and the rapid construction of mines.

The first two of these five are from the pens of General Brialmont and Captain Deguise, still their value, like that of the last three, is greater to a foreign officer than to us.

One of the contributors states that the sieges of Sebastopol, Belfort and Plevna demonstrated that works erected in the presence of a hostile force may acquire a value almost equal to that of permanent works. We believe that this nation has no need of permanent defenses other than those intended for the sea-coast, and we know of no places extensively fortified against a purely land attack which can ever be the objective of our army. Hence it is that five of the printed articles have, as has been said, a greater value to foreign officers than to ourselves, relying, as we will, if need should arise, upon improvised defensive works.

So we pass by these articles, only saying incidentally to one of them, that the value of a foot-bridge to an officer of any service may be doubted, which without its launching trestle weighs a ton; and the chances of its successful use seem slight, considering that its detachment, numbering forty-one men, must carry a load averaging eighty pounds per man and at the same time be exposed to the fire of machine and quick-fire guns, while advancing in files of thirteen men, to launch the bridge.

Of more immediate interest are Captain Jamotte's three designs for splinterproofs and bombproofs in field works.

For splinterproofs he suggests a four-inch covering of planks of a total width of three feet resting on squared six-inch timbers, or wanting the latter, upon

*Recueil des Travaux Techniques des Officiers du Génie de l'Armée Belge, I, 1897, 1xelles S. Eggericx, 266 pages et 18 planches.*

about seven inch logs, timbers or logs being about fifty-two inches between centres and supported at the rear by five-inch posts, and in front by the parapet. When plank are not available, six-inch logs will do. Using only logs, secured by rope or wire, all material being at hand, twenty-five minutes will suffice for the construction of one form of the splinterproof, by a working force of two men to three paces of front; and but little more than one hour for a second form, the force being one man to a pace.

For bombproofs, a course of fourteen logs, ten inches in diameter, is laid parallel to the crest, resting on other logs of the same size, spaced as in the splinterproofs, the latter logs supported by three posts of ten inches diameter, forty-two inches apart. On and at right angles to this course, is placed a second course of logs about twelve feet long; then twenty inches of earth; then another layer of logs of the same diameter as the first, at right angles to the crest, about fifteen feet long; and on these another twenty-inches of earth.

The clear height under splinterproofs is about three feet; under bombproofs about four feet.

The bombproof is deemed safe against a six-inch shell having an explosive charge of twelve and one-half pounds of tonite. The upper coverings of earth and logs check the shell; the lower covering of earth and the two underlying courses of logs give protection against the fragments of the shell.

A study of roof trusses is given with the object of showing how far certain hypotheses usually made as to the action of loads of snow or effects of winds on roof trusses are admissible, and how the ordinary methods of computation should be modified to better correspond to the real conditions experienced.

The remaining article, by Captain Cuvelier, Professor at the Military School, advances the necessity to the engineer, of such a knowledge of geology as will enable him to interpret borings, to draw from them proper conclusions as to the resistance of the soil, proper foundations, water supply, and utility of excavated materials.

A brief study of the quaternary periods is followed by a more extended review of the phenomena of marine deposits.

The concluding chapter contains a few errors which attention to geological indications would have prevented, in the location of canals, railroads, dams, buildings and cemeteries and the sinking of wells.

J. G. D. K.

### Lectures on Explosives.\*

The instructors at the United States Artillery School at Fort Monroe have been particularly happy in the works they have published for the use of their classes. Lieut. Walke has kept up this record by the publication of a revised edition of his course of Lectures on Explosives, a work of 425 pages, which is an exposition of the system by which he has accomplished such good results, in the short time devoted by any class to this important subject.

The work is prepared especially as a manual and guide in the laboratory of the Artillery School, where it is the endeavor to give each officer a practical knowledge of the ingredient used in the manufacture of explosives and then in the manufacture of the explosives themselves.

Lieut. Walke has presented his subject so that proficiency is acquired in

\* *Lectures on Explosives.* By 1st Lieutenant Willoughby Walke, 5th Regt. U. S. Arty. Published by John Wiley and Sons. New York. 1897.

laboratory work while testing the purity of the ingredient used in making explosives and the various explosives are taken up in such sequence that the student acquires a certain degree of familiarity in manipulating the less sensitive and dangerous mixtures before undertaking the experiments with the high explosives.

Particular attention has been given to the service tests of the various explosives and to the descriptions of the instruments used in these tests.

He has happily limited the theory of the subject to few pages, seeming to recognize that a practical knowledge of how explosives are made, how they should be handled and stored, and what their effects are, is of much more importance to the student, than could possibly be theories concerning what might happen to molecules under varying conditions of chemical combinations.

The theory he does give is taken principally from the work of M. Berthelot, "*Sur La Force des Matières Explosives d'après la Thermochimie.*"

Lieut. Walke has presented his work in the shape of twenty-two lectures.

#### LECTURE I.

being devoted to the general considerations affecting explosions and explosives.

#### LECTURE II.

is taken from the work of M. Berthelot, President de la Commission des Substances, Explosives, etc., and gives the principles of Thermochemistry as applied to explosives and the classification, and composition of explosives.

Lieut. Walke says that, "although the classification of explosives by Berthelot serves to show the unlimited nature of the subject from an abstract point of view, it is of little practical value," which opinion will undoubtedly be seconded by every student who has taken this course.

#### LECTURE III.

Gives the ingredient entering into the composition of explosives and the substances used in their preparation.

It is probably as good a work as has ever been published on this subject. Its practical value to the student cannot be over-estimated. It treats of the nitrates and the general qualitative tests applicable to all nitrates.

The quantitative tests of nitre. Potassium chlorate, nitric acid, charcoals, sulphur, sulphuric acid, hydrocarbons, benzine, toluene, naphthalene, carbohydrates, cellulose, alcohols, glycerine, ethers, acetone, camphor, vaseline, etc.

Keiseliguhr, randamite, etc., and the tests for most of these. Those given for glycerine will exemplify the thoroughness of this lecture.

"Glycerine possesses very extensive solvent powers, which property is next in importance to its capacity for nitration, in its relation to explosives."

On account of the danger arising from the formation of very unstable explosives during the process of nitration of impure glycerine, it is necessary to examine it carefully.

1st. For the presence of free acids.

Dilute 2 c.c. with an equal volume of distilled water and shake for a few minutes. Test with litmus paper. Reaction should be neutral.

2d. For the presence of carbonaceous matter, put 4 or 5 drops in a watch crystal and heat gently. It should burn with a pale blue flame, evolving a sweetish to pungent odor, and leave a mere trace of carbonaceous residue.

And so on for the tests for eighteen impurities which are apt to be found in commercial glycerine.

## LECTURE IV.

Is on explosive mixtures of the nitrate class, and deals with gun-powder and its ingredients.

## LECTURE V.

Gives a description of the special gun-powders, their manufacture and properties.

## LECTURE VI.

Gives the properties of service gun-powder, the tests to be applied to it and its analysis.

## LECTURE VII.

Is on Densimetry. It describes the Mallet and Dupont Densimeters. Gives precautions to be observed in using these instruments and the process of determining the density of a sample of powder with both instruments. It also gives a description of the gravimeter and tells how to use it.

## LECTURE VIII.

Gives the chemical theory of the combustion of gun-powder.

## LECTURE IX.

Describes the explosive mixtures of the chlorate class. Describes asphaline, Melland's paper powder, Augendre's powder dynamogen, Hahn's, Horseley's and Pertruisets's powders, and the various fuse compositions.

## LECTURE X.

Gives the classification of the explosive compounds and describes the explosive compounds of the nitro-substitution class, such as picric acid, Borlinetto's powder, Abel's powder, mélinite, bellite, emmensite and many others.

## LECTURE XI.

Classification of the Nitric Derivative class of explosive compounds and under the Nitric-Esters gives fully the chemistry and history of gun-cotton, with Von Lenk's investigations and process of manufacture of gun-cotton, also the explosive effects of gun-cotton.

## LECTURE XII. AND XIII.

Describes the manufacture of gun-cotton at the U. S. Naval Torpedo Station, and gives the service tests for gun-cotton.

## LECTURE XIV.

Devotes thirty-two pages to nitroglycerine, the representative of the Nitric Ethers.

## LECTURE XV.

Describes the gun-cotton blasting powders and dynamites, and gives the outline scheme for the analysis of nitro-glycerine preparations.

## LECTURE XVI.

Is on smokeless powders. Lieut. Walke shows the importance of this part of his subject when he says "that it is now a question of but a very short time before these new powders will surely supersede the old black and brown compositions."

## LECTURE XVII.

Explosives of the Sprengel Class, the essential principle of which is the ad-

mixture of an oxidizing with a combustible agent at the time of or just before being required for use, the constituents of the mixture being themselves separately non-explosive. Rack-a-rock, helloffite, oxonite, paucclastite and romite are described both in manufacture and explosive effects.

## LECTURE XVIII.

Is devoted to the fulminates, amides and similar compounds.

## LECTURE XIX.

Is on the manipulation, storage and transportation of high explosives, and describes the machines used to explode them.

## LECTURE XX.

Describes the application of high explosives for military purposes, and Lecture XXI. is on the use of high explosives in shell.

The last—Lecture XXII—treats of Explosions by Influence, or Sympathetic Explosions.

It is a pleasure to see Lieut. Walke's original lectures brought up to date in his new work, and it would be difficult to improve upon the way in which he presents the matter, which in a short time teaches so much of an important subject to the officers under his instruction.

The work is a valuable addition to military literature, and should be in the library of every one interested in The Study of Explosives.

E. ST. J. G.

# Annual Report.

---

The Military Service Institution of the U. S.  
Governor's Island, N. Y.

JANUARY 1, 1898.

*To the Members of the Military Service Institution of the United States.*

GENTLEMEN :—I have the honor, on behalf of the Executive Council, to submit the following report of the operations of the Institution during the past year.

The accounts of the Treasurer, after careful audit by the Finance Committee, show the business affairs of the Institution to be in a prosperous condition, the receipts for the year from all sources again exhibit an increase over those of any previous year; the balance on hand warranting the suggestion that it is now time that the Institution should take measures to provide itself with a permanent home, with offices, library, etc., and also that a modification might be made in the initiation fee.

The second of the series of annual prize essays of the Infantry Society, entitled "The necessity of a well organized and trained Infantry at the outbreak of war, and the best means to be adopted by the United States for obtaining such a force," by Lieutenant J. G. Harbord, 5th Cavalry, was published in the July number of the JOURNAL. It is a worthy and seasonable article.

The Gold Medal of the Institution for 1897 has been awarded to First Lieutenant S. M. Foote, 4th Artillery, for the best essay on the subject; "Based on present conditions and past experiences, how should our volunteer armies be raised, organized, trained and mobilized for future wars." The subject is one that has created great general interest, as is evidenced by the number of competitors for the honors, and the favorable press notices relative both to the title and the article itself.

Very respectfully,

NELSON A. MILES,

*Major General, U. S. Army.*

# The Military Service Institution.

## *President.*

Major-General NELSON A. MILES, U. S. Army.

## *Resident Vice-Presidents.*

Major-General WESLEY MERRITT, U. S. A.

Bvt. Brig.-Gen. T. F. RODENBOUGH, U. S. A.

## *Secretary.*

Capt. JAMES FORNANCE, 13th U. S. Infantry.

## *Treasurer.*

Lieut. J. C. BUSH, 5th U. S. Artillery.

## *Asst. Secretary.*

Capt. H. L. HARRIS, 1st U. S. Artillery.

## *Vice-Treasurer.*

Lieut. F. W. FUGER, 13th U. S. Infantry.

## *Executive Council.*

### *Term ending 1903.*

(Vacancy.)

EDMUNDS, F. H., Capt. 1st U. S. Infantry  
FIREBEGER, G. J., Prof. U. S. Mil. Academy.  
GLENN, Geo. E., Col. A. P. M. G.  
HUGHES, R. P., Colonel, Insp.-General.  
WOODRUFF, C. A., Major, Sub. Dept.

### *Term ending 1901.*

(Vacancy.)

BREWERTON, H. F., Major U. S. A.  
HALE, H. C., Lieut. 20th U. S. Infantry.  
KNIGHT, J. G. D., Major Corps Engineers.  
MYRICK, J. R., Major 5th U. S. Artillery.  
RODGERS, JOHN I., Col. 5th U. S. Artillery.

### *Term ending 1899.*

#### *Finance Committee.*

Col. GLENN.  
Major WOODRUFF.  
Major PATTEN.

CORBIN, H. C., Col. A. G. Dept.  
KIMBALL, J. P., Major Med. Dept.  
PARKER, JAMES, Capt. 4th U. S. Cavalry.  
PATTEN, W. S., Major Q. M. Dept.  
PHIPPS, F. H., Major Ordnance Dept.  
WEBB, A. S., Bvt. Major-General (late) U. S. A.

#### *Library Committee.*

Major KIMBALL.  
Capt. FORNANCE.  
Lieut. FUGER.

## *Publication Committee.*

Majors KNIGHT and MYRICK, Capt. EDMUNDS, and Lieut. BUSH.

## Branches

are established at West Point, Fort Leavenworth and Vancouver Barracks.

Membership dates from the first day of the calendar year in which the "application" is made, unless such application is made after October 1st, when the membership dates from the first day of the next calendar year.

"An Entrance Fee of Five Dollars (\$5) shall be paid by each Member and Associate Member on joining the Institution, which sum shall be in lieu of the dues for the first year of membership and on the first day of each calendar year, thereafter, a sum of not less than Two Dollars (\$2) shall be paid as annual dues. Annual dues commence on January 1st in each year."

NOTE.—Checks and Money Orders should be drawn to order of, and addressed to, "The Treasurer Military Service Institution," Governor's Island, New York Harbor. Yearly dues (\$2.00) include Journal.

Changes of address should be reported promptly.



## Prize Essay—1898.

I.—The following Resolution of Council is published for the information of all concerned :

*Resolved*, That a Prize of a Gold Medal, together with \$100 and a Certificate of Life Membership, be offered annually by THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES for the best essay on a military topic of current interest, the subject to be selected by the Executive Council, and \$50 to the first honorably mentioned essay. The Prizes will be awarded under the following conditions :

1. Competition to be open to all persons eligible to membership.
2. Each competitor shall send three copies of his Essay in a sealed envelope to the Secretary *on or before September 1, 1898*. The Essay must be strictly anonymous, but the author shall adopt some *nom de plume* and sign the same to the Essay, followed by a figure corresponding with the number of pages of MS.; a sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, should accompany the Essay. This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.
3. The prize shall be awarded upon the recommendation of a Board consisting of three suitable persons chosen by the Executive Council, who will be requested to designate *the Essay deemed worthy of the prize*; and also in their order of merit those deserving of honorable mention.  
In determining the essay worthy of the prize, the Board will be requested to consider its professional excellence, usefulness and valuable originality, as of the first importance, and its literary merit as of the second importance. Should members of the Board determine that no essay is worthy of the prize, they may designate one or more essays simply as of honorable mention; in either case, they will be requested to designate one essay as first honorable mention. Should the Board deem proper, it may recommend neither prize nor honorable mention. Should it be so desired, the recommendation of individual members will be considered as confidential by the Council.
4. The successful Essay shall be published in the Journal of the Institution, and the Essays deemed worthy of honorable mention shall be read before the Institution, or published, at the discretion of the Council.
5. Essays must not exceed twenty thousand words, or fifty pages of the size and style of the JOURNAL (exclusive of tables).

II.—The Subject selected by the Council at a meeting held Sept. 11, 1897, for the Prize Essay of 1898, is

"OUR WATER BOUNDARIES AND OUR INTERIOR  
WATER-WAYS; HOW TO UTILIZE AND DE-  
FEND THEM; THEIR INFLUENCE IN CASE OF  
INVASION."

III.—The gentlemen chosen by the Council to constitute the Board of Award for the year 1898 are :

REAR ADMIRAL BANCROFT GHERARDI, U. S. N.

BRIG. GENERAL WILLIAM P. CRAIGHILL, U. S. A.

HONORABLE JOSEPH H. OUTHWAITE.

GOVERNOR'S ISLAND,  
Nov. 1, 1897.

JAMES FORNANCE,  
Secretary.